



AIRVU TN 3270

AIRVU TN 5250

User's Guide



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About this manual

This manual was written by the Telxon Training and Technical Publications Group assigned to provide technical documentation and training for GCS-related products. Every effort has been made to provide accurate and concise information to you, our customer.

Reader's comments

We are interested in what you think of this manual and welcome any comments you may have that can improve it. Please send any comments to us via any of the following media.

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Overview 1

Purpose and scope of this manual

The Guide to the AIRVU TN 3270/TN 5250 Terminal Emulation provides information about Telxon's AIRVU TN 3270 and AIRVU TN 5250 terminal emulation product. This guide is designed for system administrators and users who will be installing, configuring, and operating AIRVU TN 3270 or AIRVU TN 5250. The guide also provides troubleshooting information and techniques for the AIRVU TN 3270 and AIRVU TN 5250 product.

Version covered

This manual covers AIRVU TN 3270 version 1.1 and AIRVU TN 5250 version 1.1.

Chapter summaries

This manual is arranged into 7 chapters and 2 appendices. A glossary of related terms is also provided.

Chapter 1 defines the purpose and scope of this manual and provides an overview of the AIRVU TN 3270 and AIRVU TN 5250 product .

Chapter 2 provides procedures for installing AIRVU TN 3270 or AIRVU TN 5250 on Telxon Portable Telecommunications Computers (PTCs) and Pen-based Computers (PBCs).

Chapter 3 explains how to configure AIRVU TN 3270 or AIRVU TN 5250 terminals. The chapter also provides a

comprehensive reference to A_{IR}V_U TN 3270 and A_{IR}V_U TN 5250 configurable parameters.

Chapter 4 is a collection of notes pertaining to host issues related to the A_{IR}V_U TN 3270 or TN 5250 product.

Chapter 5 provides instructions for beginning and ending an A_{IR}V_U TN 3270 or TN 5250 session.

Chapter 6 provides instructions for using the PTCs or PBCs as A_{IR}V_U TN 3270 or TN 5250 terminals.

Chapter 7 identifies a troubleshooting philosophy for the A_{IR}V_U TN 3270 and A_{IR}V_U TN 5250 product. The chapter also lists and defines PTC or PBC error codes that can be displayed during operation.

Appendix A provides illustrations of the emulation keyboards for PTCs and PBCs capable of running A_{IR}V_U TN 3270 or A_{IR}V_U TN 5250 emulations.

Appendix B provides wand sequencing tables for A_{IR}V_U TN 3270 and A_{IR}V_U TN 5250 emulations.

Appendix C contains a quick reference list of A_{IR}V_U TN configuration parameters, their ranges and defaults.

Document conventions

Notes

Notes provide supplementary comments or explanations. They are set off in the left-hand columns of this manual.

Related documents documents

New product documents may be available. Contact your Telxon representative for more information.

Some of the documents listed may be available in an electronic format. Contact your Telxon sales representative for details.

The following related documents may be helpful to you.

Guide to the ANSI Terminal Emulation, PTC-TCP Version, part number 19403-000

Guide to the PTC-860DS, part number 15123-000

Guide to the PTC-860IM, part number 15592-000

Guide to the PTC-870IM, part number 19408-000

Guide to the PTC 912, part number 17604-000

Guide to the PTC-960DS, part number 15131-000

Guide to the PTC-960RL, part number 20372-000

Guide to the PTC-960SL, part number 20361-000

PTC-1134 User's Guide, part number 19364-000

PTC-1144 User's Guide, part number 19177-000

PTC-1184 User's Guide, part number 19137-000

Guide to Maintaining NiCd Batteries, part number 16488-000

Overview of Spread Spectrum Technology, part number 17071-000

ARLAN 630 Ethernet Access Point User Guide, part number P-81261-501

Refer to the guide for your host computer and modem (or modem eliminator) for information on host connectivity.

AIRVU TN 3270/5250 overview

The AIRVU TN 3270 or TN 5250 software system is a part of Telxon's AIRVU TN direct Local Area Network (LAN) Connectivity System. AIRVU TN 3270 or TN 5250 provides native Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity between wireless MS-DOS Portable Teletransaction Computers (PTCs) running 3270 or 5250 emulation and a host computer on an Ethernet or Token Ring LAN. AIRVU TN 3270 or TN 5250 provides full 3270 or 5250 emulation for Telnet sessions with host computer (TN server) applications. Some of the obvious advantages to the AIRVU TN 3270/5250 system are:

- Provides open systems connectivity
- A controller is not required for direct Ethernet or Token Ring access.
- Each PTC/PBC in the system appears as a computer on the LAN.
- all Ethernet or Token Ring wiring specifications are supported.

AIRVU TN 3270/5250 supports the following Telxon MS-DOS spread spectrum RF PTCs (including industrial mount units) and specific Pen-based Computers (PBCs).

- PTC-860IM, PTC-960X, PTC-960SL, and PTC-960RL

These units require 256 KB application ROM and 1 MB RAM.

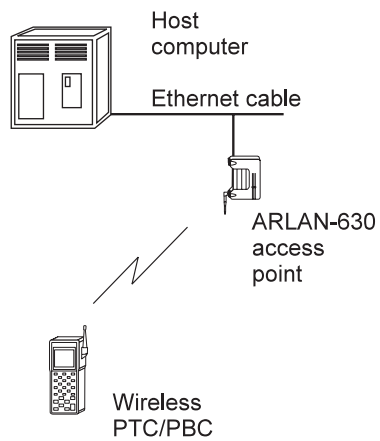
- PTC-1134, PTC-1144, PTC-1184, and PTC-870IM

These units require 2 MB application ROM, 2 MB application RAM, and a 2 MB hard disk

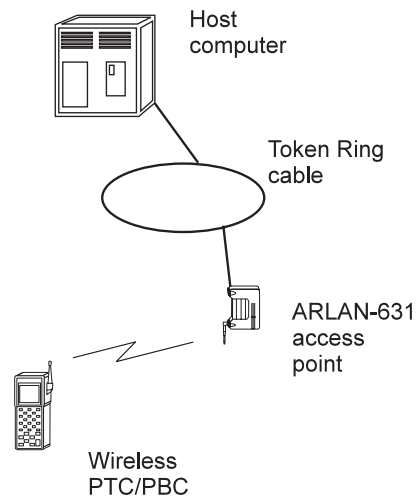
Wireless connectivity to the LAN is accomplished using access points. The ARLAN-630 access point is

used to connect the wireless device to an Ethernet LAN, and an ARLAN-631 is used to connect to a Token Ring LAN. Both 900 MHz and 2.4 GHz frequency bands are supported. The following illustration shows simplified configurations for Ethernet and Token Ring LANs.

Ethernet



Token Ring



AIRVU TN 3270/5250 incorporates PC/TCP kernel software licensed from FTP Software, Inc. PC/TCP kernel software maintains TCP/IP sessions directly with host computers via the ARLAN access points and a wired LAN.

In the system, each AIRVU TN 3270 or TN 5250 PTC/PBC has a unique Internet Protocol (IP) address. Data is transmitted over the wireless link to the access point using standard TCP/IP frames. The access point acts as a wireless hub, exchanging messages passively between the wired LAN and the wireless network.



Installing AIRVU TN 3270/5250 2

A detailed explanation of the flashing process is contained in the *Guide to the Flash Utilities*, Telxon part number 16541-000.

This chapter provides procedures for installing the AIRVU TN 3270 or TN 5250 product, or an updated version, on a PTC. Two procedures are provided: one for installing the product on a standard PTC, such as the PTC-860 or PTC-960, and one for the PTC-870IM. Both procedures involve “flashing” the unit’s EEPROM, but use different flashing utilities to perform the flashing operation.

Flashing is a procedure used to electronically store data or replace data in the PTC’s Electrically Erasable Programmable Read Only Memory (EEPROM).

Installing AIRVU TN 3270/5250 in a standard PTC

To install the AIRVU TN software on a standard PTC, you will need the following hardware and software:

- The PTC (or PTCs) you intend to install the AIRVU TN product on
- A download cable designed for the PTC to be flashed
- A PC containing the utility program FLASHPC.EXE
- The AIRVU TN product application image file you wish to install.

Before you begin the installation process, make sure the PTCs you are flashing have fully charged battery packs installed. If the batteries are low, the installation process will abort.

Follow these steps to install the A_{IR}V_U TN product.

1. Connect the download cable to the PTC's connector. Connect the other end of the download cable to the PC's comm port (if it is not already connected).
2. On the PC, load the FLASHPC program. You should see a screen similar to the one below.

Telxon Flash Loader (Version x.x)

Enter the ARC image filename (return if none)

=>

Enter the RF image filename (return if none)

3. Enter the A_{IR}V_U TN product ARC image filename.
4. Press the Enter key.
5. At the Enter RF Image file prompt, press Enter. The following menu displays:

Q. Quit

1. Send the image(s) to PTC
2. Select baud rate
3. Select comm port n
4. Reselect an ARC file
5. Reselect an RF file

Current file selection(s):

ARC = (the ARC image filename you entered appears here)

RF =

Enter (0-5):

6. Select item 2 (Select baud rate). The baud rate screen displays:

Select the desired baud rate:

- 0. Quit
- 1. 9600 baud
- 2. 19.2 K Baud
- 3. 38.4 K Baud
- 4. Autobaud (default)

Enter (0, 1, 2, 3, or 4):

You can cancel your selection by pressing the Esc key.

7. Select item 3, the highest possible baud rate. The Main Menu displays again.
8. On the PTC, make sure you are logged out of any application. You should begin at the Login screen. Press the PTC's ON/OFF key.
9. Reboot the PTC and load its operating system by holding down the CTRL and ENTER keys while pressing and releasing the ON/OFF key. Continue to hold down the CTRL and ENTER keys until you see a cursor appear in the upper left corner of the PTC's display.
10. When the date and time prompts display, press ENTER to bypass them. The C:> prompt should appear.
11. At the C:> prompt, type the following command:
FLASHR
and press the ENTER key.
12. When the FLASHR menu appears on the PTC's display, select 0 for system control.
13. Answer Y when prompted to flash the PTC.

The PTC should sound a long beep, followed by a series of single beeps. These beeps indicate that the PTC is in the Flash Mode.

14. Return to the PC and select item 1, Send image(s) to the PTC.
15. When the FLASHPC program is ready to flash the image to the PTC's EEPROM, it informs you. Accept this message and begin the flashing operation by pressing the PC's ENTER key.

The flashing process begins. On the PC, you will see a status area informing you of the flashing progress. When the process is completed, the PTC will sound a beep and the PC's screen informs you that the flashing has been completed.

An error will occur if the PC does not have sufficient memory to flash the file or if the file you are flashing is too large to fit into the PTC's memory. If an error occurs, the PC displays a message and returns you to the Main Menu.

16. When flashing is complete, press the ESC key on the PC and return to the FLASHPC Main Menu.
17. At the PC's Main Menu, select option 0 to exit the FLASHPC program and return to the command prompt (or Desktop if in Windows).
18. Disconnect the download cable from the PTC.
19. The PTC should reboot to the Login screen. If it does not, press the ON/OFF key.

The installation process is complete.

Installing the product on multiple PTCs

The FLASHPC program allows you to flash multiple PTCs and automatically skips some of the procedure described above. Once you finish flashing the first PTC and are back to the FLASHPC Main Menu, you will notice that option 1 has changed to "Resend Image." To flash another PTC, follow steps 9 through 14 to prepare a new PTC. Then attach a download cable

and choose 1 from the PTC's menu. Press any key on the PC to begin the flashing process again.

Installing AIRVU TN 3270/5250 on a PTC-870IM

Additional information about FLASH386.EXE can be found in the *Pen-based 11x4 Series Software Development Kit, Programming Tools*, Telxon part number 20181-107.

Installing the AIRVU TN product on a PTC-870IM requires that you run the FLASH386.EXE program on the PTC instead of FLASHR.EXE. The FLASHPC.EXE utility is still used on the PC. When you have FLASH386.EXE running on the PTC, the installation procedures are the same as those for installing AIRVU TN on a standard PTC.

To install the AIRVU TN 3270 or TN 5250 software on a PTC-870IM, you will need the following hardware and software:

- The PTC-870IM you intend to install the AIRVU TN product on
- A download cable designed for the PTC-870IM
- A PC containing the utility program FLASHPC.EXE
- The AIRVU TN product application image file you wish to install

Follow these steps to install AIRVU TN 3278 or TN 5250:

1. Turn the PTC-870IM off.
2. Connect the download cable to the PTC-870IM's communication port. Connect the other end of the cable to the PC's comm port (if it is not already connected).
3. Turn the PTC-870IM back on.
4. Continuously press the F5 key while the unit boots. The reason for this is to prevent the PTC-870IM from running its AUTOEXEC.BAT and CONFIG.SYS files. A conflict exists between the

If you experience problems performing this step, you can call Telxon's Customer Support Center for an alternate installation procedure.

FLASH386.EXE and EMM386.EXE programs.
EMM386.EXE must not be loaded in order to perform the installation using FLASH386.EXE.

5. When the command prompt displays, release the F5 key.
6. At the command prompt, run FLASH386.EXE.
The unit may begin beeping until it is connected to the PC.
7. At the PC, run FLASHPC.EXE.
8. Follow the steps for flashing a standard PTC, beginning at step 2 on [page 8](#).

Installation is complete. The PTC-870IM should reboot to the Login prompt.



Configuring AIRVU TN 3270/5250 3

This chapter explains how to configure a PTC or PBC after installing AIRVU TN 3270 or AIRVU TN 5250. Because the configuration process is almost identical for each emulation, most of the configuration parameters apply to AIRVU TN 3270 or AIRVU TN 5250 and have the same ranges and defaults. Where there are exceptions, an appropriate note appears.

Configuration overview

AS/400 machines have the ability to connect to TCP/IP networks. Client emulation terminals that use 5250 terminal emulation can connect to TELNET port (23) on the AS/400. IBM mainframe hosts (370 and ES/9000) can also be configured to utilize TCP/IP and utilize emulation terminals that use 3270 emulation.

There are six major groups of configuration parameters for a PTC running AIRVU TN 3270 or AIRVU TN 5250 emulation:

- RF parameters and the MAC address
- Internet Protocol (IP) parameters
- Timing parameters
- Aesthetic parameters
- Barcode scanner (wand) parameters
- DOS config note

In addition, the host (AS/400 or IBM main frame) and the access point must also be configured before the AIRVU product can run successfully.

RF parameters

The radio frequency band and data transfer rate must be set in order for the PTC to communicate with an access point. This is determined by the channel setting for 900 MHz systems, and frequency and bit rate for 2.4 GHz systems. In addition, a System ID must be established that is embedded in every data packet as a kind of tag that is used by receiving nodes to detect messages that belong to their system. Any packet whose tag is different than that of the receiver is rejected.

Internet Protocol (IP) parameters

The PTC is an internet device that has the same configuration variables as any work station that utilizes an IP stack. The access point is a bridge that transfers MAC layer frames between the radio link and the Ethernet LAN. With the exception of protocol filtering by the access point, it is not aware of the types of packets carried by the MAC layer frame.

IP parameters for PTCs consist of the following:

- An **IP address** that identifies the PTC in the intranetwork.
- Two **subnet routers** (an IP address for the router that receives IP packets that are destined for stations on other subnets).
- A **subnet mask** (a value used to determine the network and host portions of IP packet addresses).
- The **broadcast address** (an IP address that is used for limited broadcasts).
- The **host address** (an IP address of the AS/400 or IBM main frame host that operates the TELNET server process).

Timing parameters

PTCs that use the power saving protocol suspend the activity of all internal power consuming devices including its radio receiver, to extend battery life. The PTC powers up momentarily and transmits a poll to the access point in order to fetch any packets the access point has for it. There are a number of timing parameters that determine when the PTC polls the access point for data packets. One of these parameters, the **fast poll delay**, is critical to PTC performance. The fast poll delay parameter determines how soon a poll is sent following a successful transmission. It is the most critical timing parameter for AirVu TN 3270 and AirVu TN 5250 systems because an ARP request from another station must be answered quickly with an ARP response. Therefore, the fast poll delay parameter should be set to zero or a very low value so that the PTC can poll and pick up the ARP response before it times out and goes into the power saving mode.

Other poll timing parameters determine the frequency of polls that follow the first poll. The default values of these parameters are effective in virtually every case, and do not need to change.

Aesthetic parameters

Aesthetic parameters deal with the PTCs display, backlight, cursor, and so on. These parameters can be set to your preference and have little effect on data flow in the system.

Barcode scanner (wand) parameters

Barcode scanners are not built in to every PTC capable of running AirVu TN 3270 or AirVu TN 5250 emulation. For this reason, a **scanner type** must be selected. Once a scanner type is selected, you must configure the bar code types that you want the PTC's scanner to read. You can select and configure up to 6

bar code types that can be scanned in no particular order. Setting the PTC to **shuffle** allows this to occur. If there is usually one bar code type to be scanned, setting the **keep order** parameter and setting the first barcode configuration to the one most frequently scanned accomplishes this. If you choose shuffle, the last bar code type you scanned moves to the top and stays there until you scan a different type.

Making configuration changes

All configuration changes are made via the PTC or PBC by accessing menus and making selections from menu options. Any configuration changes you make (with the exception of the PTC ID) are automatically invoked; saving is not necessary and the PTC/PBC is ready to use with your configuration changes. When you change the PTC ID, you must reboot the PTC in order for that change to take effect.

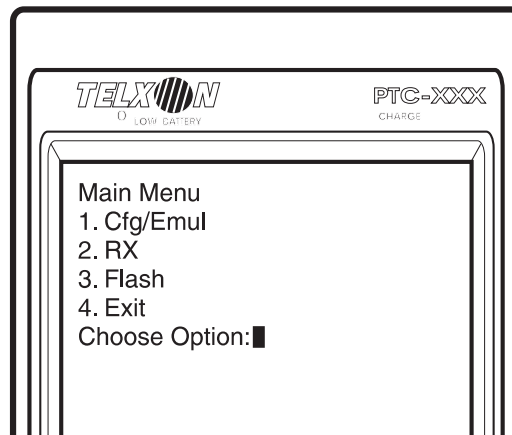
You configure the A_{IR}V_U TN device by either accepting or changing its default parameters in the following configuration areas:

PTC	Those parameters dealing with how the PTC or PBC interfaces with the A _{IR} V _U TN emulation.
RF	Those parameters that permit the PTC or PBC to connect to and communicate with an ARLAN-630 or 631 access point.
Wand	Those parameters that identify the unit's barcode scanner and the barcodes that the scanner is to recognize and scan.

Menu navigation

PTCs

A typical PTC menu display is shown in the illustration below.



To navigate a PTC's menu system, you make selections by pressing the number or letter that corresponds to that selection. When you make your selection, the unit displays either a submenu or goes directly to the first of a series of configuration screens from which you make changes. Pressing the ENTER key advances you through the configuration screens until the submenu you started from displays again.

Configuration screens normally contain default settings. Pressing the ENTER key accepts the default setting or any change you make and advances you to the next configuration screen.

A typical configuration screen looks like the one in the illustration below:

```
PTC ID
(1 - 254)
[001] _
```

The first line identifies the screen's parameter

The second line, in parentheses, shows the acceptable range of the parameter.

The third line, in brackets, displays the parameter's default setting. This line also shows the syntax of the parameter if you decide to change it.

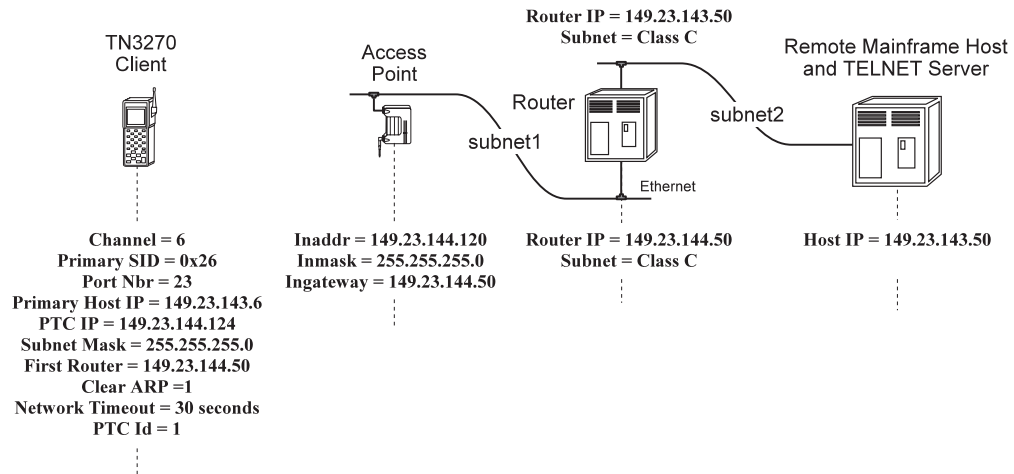
The cursor is displayed next to the default setting, and can be either a line or a block. You enter your changes at the cursor.

To change a default setting, enter the new setting using the keyboard, then press the ENTER key to accept the new setting and advance to the next screen. Continue advancing through the configuration screens, making changes as necessary until the sub-menu displays.

PBC/PTC-870IM

Navigating a PBC or PTC-870IM menu is similar to a PTC except that the keyboard is displayed on the unit's screen and is accessed using a light pen. A typical PBC or PTC-870IM menu screen and keyboard looks similar to the one in the illustration on the **following page**.

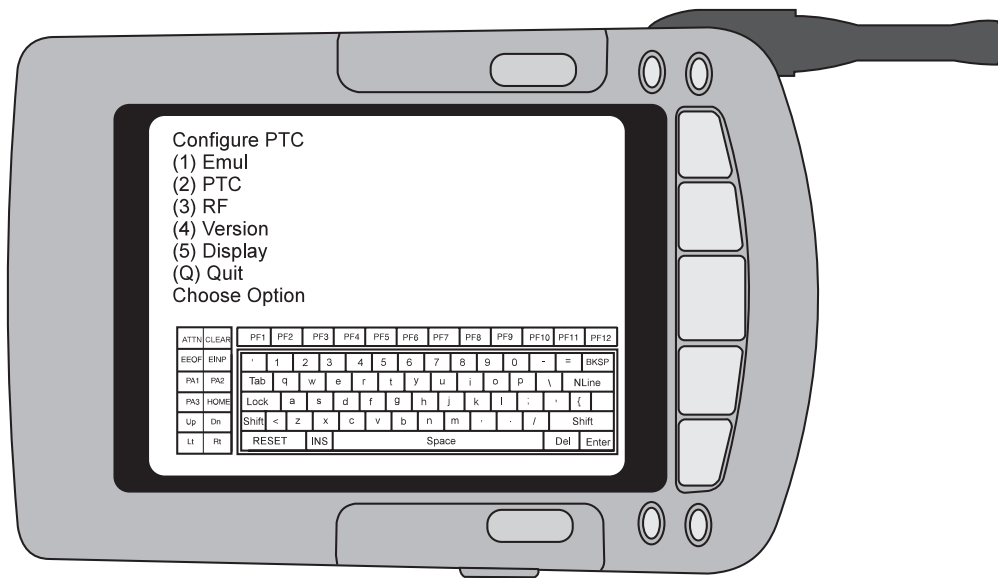
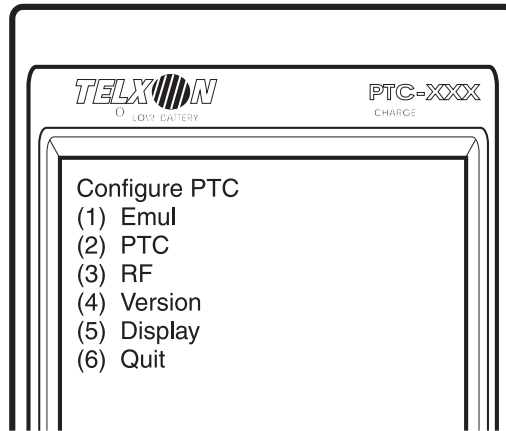
A typical TN3270 configuration.



Menu selections and configuration changes are made like those described for a PTC.

(1) Cfg/Emul

Choosing option 1, Cfg/Emul, displays the Configure PTC Menu as shown below on all PTCs, PBCs, and the PTC-870IM.



Selecting 1 (Emul) starts an emulation session. For more information about sessions, see [Chapter 5](#).

Selecting 2 (PTC) accesses A_{IR}V_U TN 3270 or A_{IR}V_U TN 5250 configurable parameters. Information about

configuring a PTC or PBC are included later in this chapter.

Selecting 3 (RF) allows you to configure a PTC's or PBC's radio so it can communicate with its access point.

Selecting 4 (Version) displays the AIRVU TN product version information on a screen similar to the illustration below.

```
DOS V5.0
RF Firmware V5.6
Pkt Driver V3.0
```

Hit Any Key

Pressing any key displays the AIRVU TN product version information for approximately 3 seconds before returning you to the Configure PTC Menu.

Selecting 5 (Display) allows you to change the PTC's display characteristics. The menu displayed depends on the type of PTC you are using. If you want to change the default display setting, make your changes and press Q to return to the Configure PTC Menu.

Selecting Q exits the PTC Configuration Menu and returns you to the Main Menu.

(2) RX

Choosing Option 2, RX, configures a communication program, Xmodem. This program allows you to download files via a serial connection to another device, such as a PC.

(3) Flash

Choosing Option 3, Flash, allows you to prepare the unit for flashing an image to its ROM.

(X) Exit

Choosing Exit returns you to the unit's command prompt.

Configuration examples

This section is designed to help you configure a `AIRVU` TN 3270 or `AIRVU` TN 5250 system. In these examples, specific configuration values are used for a PTC and access point on one subnet connected through a router to the host on another subnet. The tables containing the examples have been filled in with the values of a specific system (Your system values may differ).

The table below shows a typical `AIRVU` TN 3270 or `AIRVU` TN 5250 configuration. To find information on how to set up an AS/400 TELNET server, refer to IBM document # SC41-3420-00, *TCP/IP Configuration and Reference*. Chapter 6 of this document discusses how to set up the TELNET server.

Parameter	Comment	Value
Internetwork IP parameters		
Existing network configuration		
Host IP Address	The IP address of the host	149.23.143.6
TELNET Server port #	The Host's TELNET Server port number	23
Subnet Network Address	Identifier for the network portion of subnet 1's address	149.23.144.0
Subnet Router	IP address of the router used to reach hosts located in subnet 2	149.23.144.50
Access point TELNET configuration		
Inaddr	Address used to TELNET to an access point	144.23.144.120
Inmask	Subnet mask used to TELNET out from an access point	255.255.255.0

Parameter	Comment	Value
Ingateway	Address of default router used to TELNET out from an access point	149.23.144.50
PTC configuration		
Port Number	Port number of the TELNET Server. Always 23 unless server is custom	23
Primary Host IP Address	The IP address of the host	149.23.143.6
PTC IP Address	The IP address of the AIRVU TN 3270/TN 5250 client	149.23.144.124
Broadcast Address	The IP broadcast address	255.255.255.255
Subnet Mask	The mask used to isolate the network portion of an IP address	255.255.255.0
First Router	The IP address of the subnet router used to reach destinations outside the PTC's subnet	149.23.144.50
Second Router	The secondary subnet router's IP address	
Address of First DNS	IP address of the first Domain Name Server	
Address of Second DNS	IP address of the second Domain Name Server	
Address of Third DNS	IP address of the third Domain Name Server	
Clear ARP Table Upon Startup	Controls clearing of ARP cache when emulation starts	Do
Network Timeout	Time in seconds to establish session with server	30
PTC ID	Appended to '0x02409600' Determines the PTC MAC address	1

The table below shows a typical radio parameter configuration for 900 MHz and 2.4 GHz systems.

Parameter	Comment	Value
900 MHz systems		
Channel	The radio channel within the 900 MHz bandwidth that the PTC operates on. Set to match the access point's channel.	6
Primary System ID	A common identifier for the radio devices	0x26
Access point configuration		
Channel	The radio channel within the 900 MHz bandwidth that the access point operates on. Set to match the PTC's channel	6
System Identifier (SID)	A common identifier for the radio devices	0x26
2.4 Ghz systems		
PTC Configuration		
Primary Frequency	The frequency within the 2.4 GHz bandwidth that the PTC operates on. Set to match the access point's frequency	3 (an index for 2442 MHz)
Primary Bit Rate	The bit rate for the selected primary frequency. Set to match the access point's bit rate	3 (an index for 1000 Kbps)
Primary System ID (SID)	A common identifier for the radio devices	0x26
Access point configuration		
Frequency	The frequency within the 2.4 GHz bandwidth that the access point operates on. Set to match the PTC's frequency	2442 MHz
Bit Rate	The bit rate for the selected frequency. Set to match the PTC's bit rate	1000 Kbps
System Identifier (SID)	A common identifier for the radio devices	0x26

A quick reference table of all AirVu TN 3270 and TN 5250 parameters can be found in [Appendix C](#).

Parameter Reference

Configurable parameters are referenced in this section by menu, beginning with the menu that you would normally access first as you configure a PTC/PBC. Parameters accessible within a specific menu are listed in the order that they appear in the menu. A menu map (a picture of the menu structure) precedes the parameters for that particular menu. All parameters are presented in the following format:

Parameter

Path:	Lists the menu path where the parameter may be found.
Description:	Provides a brief description of the parameter's purpose.
Range:	Lists the parameter's possible settings or a range of selectable values.
Default:	Lists the parameter's default value or setting.
Notes:	Provides additional information about the parameter.

Configuration parameter categories

The AirVu TN 3270/TN 5250 PTC Configuration Menu contains the following major categories:

- Main Menu parameters
- PTC configuration parameters
- RF parameters
- Display parameters
- Wand parameters

Main Menu Parameters

RX

Description:	Enables the PTC to receive and transmit files via a serial download cable.
Range:	Receive File Transmit File Exit
Default:	None
Notes:	Choosing Receive File causes the PTC to begin receiving data from a connected device. Choosing Transmit File allows data to be transmitted to a connected device. Choosing Exit returns to the Main Menu

Flash

Description:	Prepares the PTC for flashing an image to its ROM.
Range:	System Control User Control Exit
Default:	None
Notes:	Choosing System Control displays a prompt asking you if you want to program the flash ROM now. Choose Y or N as appropriate. Choosing User Control displays a screen from which you can select the ROM you want to flash: RF ROM ARC ROM Exit

Exit

Description: Exits to the unit's command prompt.

Range: None

Default: None

Notes: None

PTC configuration parameters

PTC ID

Path: Config/Emul - PTC

Description: Assigns a unique identification number to each PTC in the network.

Range: 001 - 254

Default: 001

Notes: This parameter is a decimal value.

No two PTCs in the same network can have the same PTC ID.

Proximity Scan (PTC-912 only)

Path: Config/Emul - PTC

Description: Defines a scanner mode that automatically turns on the PTC-912's scanner when it detects a bar code label within its range.

Range: Off
On

Default: Off

Notes: None

Display Intense Fields As

Path:	Config/Emul - PTC
Description:	Specifies whether high intensity fields are displayed in normal or reverse video.
Range:	Normal Reverse
Default:	Reverse
Notes:	None

Status Line

Path:	Config/Emul - PTC
Description:	Enables or disables the PTC's status line.
Range:	Enable Disable
Default:	Enable
Note:	The PTC's status line is normally at the bottom of the PTC's screen.

Cursor Type

Path:	Config/Emul - PTC
Description:	Specifies the type of cursor displayed on the PTC's screen.
Range:	Underline Block
Default:	Underline
Notes:	None

PTC Timeout

Path:	Config/Emul - PTC
Description:	Specifies the amount of time in minutes that the PTC must remain idle before it automatically shuts itself off to conserve power.
Range:	0 - 60
Default:	05
Note:	If you enter a 0 for this parameter's value, the PTC never times out and remains on until you turn it off. In TCP/IP networks, powering off a PTC for too long can cause session loss.

Bklt Tmout (Backlight Timeout)

Path:	Config/Emul - PTC
Description:	Sets the time in seconds that the PTC's backlight remains on after it has been turned on. The backlight is turned on by a keystroke. Each time a key is pressed, the timer is reset. If the backlight goes out, a keystroke turns it back on again.
Range:	0 - 240
Default:	30
Note:	The value you specify for this parameter when you turn the PTC on. This parameter is active when the device is in emulation. You must turn on the backlight manually if the Backlight After Keypress parameter is disabled.

Backlight After Keypress

Path:	Config/Emul - PTC
Description:	Sets the PTC so that its backlight turns on automatically when a key is pressed or a bar code is scanned. The backlight stays on for the period set by the Bklt Timeout parameter.
Range:	Disable Enable
Default:	Disable
Notes:	None

Bypass Exit Menu

Path:	Config/Emul - PTC
Description:	Sets the PTC/PBC/PTC-870IM to bypass its Exit Menu when the Exit key is pressed.
Range:	Disable Enable
Default:	Disable
Note:	When this parameter is enabled, the device exits emulation without displaying the Exit Menu. If Auto Run is turned on, the PTC returns to emulation automatically.

Auto Run

Path:	Config/Emul - PTC
Description:	Enables or disables the Auto Run mode.
Range:	Disable Enable
Default:	Disable
Notes:	When this parameter is enabled, the PTC automatically re-enters emulation on exit. When the parameter is enabled, the PTC is only capable of running emulation and cannot be re-configured. If this parameter is disabled, the PTC runs normally.
	See Also: Bypass Exit Menu

Auto Run Password

Path: Config/Emul - PTC

Description: Sets Auto Run Password

Range: 1-9 Alphanumeric characters

Default: telxon

Notes: This parameter is case sensitive.

The password is effective when Auto Run is enabled.

Use Print Bit (3270)

Path: Config/Emul - PTC

Description: Sets a Write Control Character (WCC) bit to allow TN 3270 local printing.

Range: Ignore Bit
Use Bit

Default: Ignore Bit

Notes: Set this parameter to Use Bit to enable printing to a local printer.

Printer (5250)

Path:	Config/Emul - PTC
Description:	Selects the printer type on which the PTC can print data.
Range:	Local System
Default:	Local
Notes:	Select Local to print to a printer connected to the PTC. Select System to print to a network printer.

Update Cursor Upon New Chunk (5250)

Path:	Config/Emul - PTC
Description:	Determines the PTC's cursor position when a new chunk of 24x80 screen data displays on the PTCs screen and moves it to the chunk's first unprotected field.
Range:	Disable Enable
Default:	Disable
Note:	The PTC screen shows only portions or "chunks" of the 24x80 screen data at a time. When you finish entering data in one chunk the next chunk displays. By enabling this parameter, the cursor moves to the first unprotected position of the first field in the new chunk.

RF parameters

Primary System ID

Path:	Config/Emul - RF
Description:	Sets the hexadecimal system identification number for the RF LAN in which the PTC resides.
Range:	2-ffffffe
Default:	000002
Notes:	Every PTC in the same RF LAN must have the same primary system ID.

Port Number

Path:	Config/Emul - RF
Description:	Identifies and sets the TCP/IP port through which the PTC communicates to the host.
Range:	00000 - 65535
Default:	00023
Note:	The default port number, 23, sets a Telnet port.

Primary # Channels (900 MHz systems)

Path:	Config/Emul - RF
Description:	Sets the number of channels used in 900 MHz systems.
Range:	1 - 4
Default:	1
Notes:	None

Primary Channel (900 MHz systems)

Path:	Config/Emul - RF
Description:	Sets the primary channel number for each of the channels selected in the Primary # of Channels parameter.
Range:	0 - 11
Default:	11
Notes:	None

Primary Frequency (2.4 GHz systems)

Path:	Config/Emul - RF
Description:	Sets the primary frequency within the 2.4 GHz frequency band that the PTC/PBC/PTC-870IM radio operates on.
Range:	1 - 5
Default:	03
Notes:	None

Primary Bit Rate (2.4 GHz systems)

Path:	Config/Emul - RF
Description:	Sets the bit rate of the selected primary frequency.
Range:	1 - 4
Default:	04
Notes:	None

Primary Host IP Address

Path:	Config/Emul - RF
Description:	Establishes the Internet Protocol (IP) address for the primary host. It is a character string consisting of four integers or letters separated by decimal points (for example 128.127.50.100 or myhost.mycompany.com).
Range:	0 to 15 characters (including decimals). Valid integers are 0 to 254.
Default:	None
Note:	This parameter must be set in order for the PTC to communicate with its host. The address specified must match the address of the primary host.

PTC IP Address

Path:	Config/Emul - RF
Description:	Establishes the Internet Protocol (IP) address for the PTC. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	0 to 15 characters (including decimals). Valid integers are 0 to 254.
Default:	None
Note:	This parameter must be set in order for the PTC to communicate with its host.

Broadcast Address

Path:	Config/Emul - RF
Description:	Establishes the Internet Protocol (IP) address for broadcast messages. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	0 to 15 characters (including decimals). Valid integers are 0 to 255.
Default:	255.255.255.255
Notes:	None

Subnet Mask

Path:	Config/Emul - RF
Description:	Identifies the mask used to isolate the network portion of an IP address. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	0 to 15 characters (including decimals). Valid integers are 0 to 255.
Default:	255.255.255.0
Notes:	None

First Router

Path:	Config/Emul - RF
Description:	Sets the IP address of the subnet router to use to reach destinations outside the PTC's subnet. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	None
Default:	None
Notes:	Refer to the illustration on page 19 to see how the router fits in a typical RF LAN.

Second Router

Path:	Config/Emul - RF
Description:	Sets the IP address of the secondary subnet router, if one has been selected. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	None
Default:	None
Notes:	The second router is used if communication fails using the first router.

Address of First DNS

Path:	Config/Emul - RF
Description:	Identifies the IP address of the first Domain Name Server (DNS), a computer holding a database that maps IP address to plain English names. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	None
Default:	None
Notes:	None

Address of Second DNS

Path:	Config/Emul - RF
Description:	Identifies the IP address of another DNS holding a database that maps IP addresses to plain English names. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	None
Default:	None
Notes:	None

Address of Third DNS

Path:	Config/Emul - RF
Description:	Identifies the IP address of a third DNS holding a database that maps IP addresses to plain English names. It is a character string consisting of four integers separated by decimal points (for example 128.127.50.100).
Range:	None
Default:	None
Notes:	None

Clear ARP Table Upon Startup

Path:	Config/Emul - RF				
Description:	Determines whether or not the Address Resolution Protocol (ARP) cache is cleared when TN is started.				
Range:	<table><tr><td>Do not clear</td><td>Does not clear the ARP cache each time emulation is started.</td></tr><tr><td>Clear</td><td>Automatically clears the ARP cache each time emulation is started.</td></tr></table>	Do not clear	Does not clear the ARP cache each time emulation is started.	Clear	Automatically clears the ARP cache each time emulation is started.
Do not clear	Does not clear the ARP cache each time emulation is started.				
Clear	Automatically clears the ARP cache each time emulation is started.				
Default:	Clear				
Notes:	The ARP is the TCP/IP protocol used to dynamically bind a high-level IP address to a low-level hardware address. ARP is used across a single physical network and is limited to networks that support hardware broadcast.				

Network Timeout

Path:	Config/Emul - RF
Description:	Sets the time in seconds allowed for a PTC to establish a session with a host.
Range:	0 - 00030
Default:	00030
Notes:	None

Registration Mode

Path:	Config/Emul - RF
Description:	Determines the method the PTC uses to register with its router.
Range:	Normal TMA Mode (radio is always on) Power Saving TMA Mode (radio is either off or on)
Default:	Power Saving TMA Mode
Notes:	When Normal TMA Mode is selected, the Registration Refresh Rate parameter displays.

Registration Refresh Rate

Path:	Config/Emul - RF
Description:	Establishes how often a PTC polls when in Normal TMA Mode. When in Normal PTC Mode, the PTC's radio is always on.
Range:	0 - 65535 milliseconds (in 10 ms increments)
Default:	00000
Notes:	This parameter can be set only when Normal TMA Mode is selected as the unit's registration mode.

Poll Delay

Path:	Config/Emul - RF
Description:	Sets the amount of time in milliseconds (ms) that a PTC waits after a transmission before it begins polling for a response.
Range:	0 - 65535
Default:	00500
Notes:	This parameter takes effect only when power saving TMA mode is selected.

Poll Decay

Path:	Config/Emul - RF
Description:	Sets the polling rate at which fast polling decays to slow polling.
Range:	0 - 255
Default:	002
Notes:	This parameter takes effect only when power saving TMA mode is selected.

Fast Polling

Path:	Config/Emul - RF
Description:	Sets the amount of time in milliseconds (ms) between each poll during fast polling.
Range:	00000 - 65535
Default:	00250
Notes:	Fast polling begins immediately after the poll delay time has elapsed. This poll rate is relatively fast because it polls during a time period when a response is expected. This parameter takes effect only when power saving TMA mode is selected.

Slow Polling

Path:	Config/Emul - RF
Description:	Sets the time in milliseconds (ms) increments between each poll during slow polling.
Range:	00000 - 65535
Default:	10000
Note:	Polling is set to decay from fast to slow according to the poll decay rate so that the PTC uses fast polling when a response is most likely to occur and slow polling at any other time. This way, slow polling can keep track of the system while using less power than fast polling. This parameter takes effect only when power saving TMA mode is selected.

ARL Threshold

Path:	Config/Emul - RF
Description:	Establishes the average retry level threshold at which a node attempts to find a better router.
Range:	0 - 255
Default:	004
Notes:	None

ARL Decay

Path:	Config/Emul - RF
Description:	Sets a cumulative average retry level value.
Range:	0 - 255
Default:	001
Notes:	The value set specifies the cumulative value that ARL is decayed for each successful transmission. 0 implies a default of 1; 255 implies an infinite ARL.

Find Router Size

Path:	Config/Emul - PTC - RF
Description:	Selects the Find Router Size in bytes
Range:	1508 bytes 8 bytes
Default:	1508 bytes
Notes:	Press 0 to select 1508 bytes or 1 to select 8 bytes.

Display parameters

Display Type

Path:	Config/Emul - PTC - Display
Description:	Sets the display type in characters x lines
Range:	16x21 16x16 8x21 8x16 Quit
Default:	None, display indicates the current setting.
Notes:	You must select Quit in order to exit this screen and return to the Configure PTC Menu.

Wand parameters

The menus and configuration screens that display depend on the barcode type you select. All possible wand configuration parameters are described in this section, even though they may not display for your particular wand configuration.

Short Scan

Path:	Config/Emul - Wand
Description:	Permits a short bar code to fill an entire field.
Range:	Disable Enable
Default:	Enable
Note:	When you enable this parameter, the PTC responds as if a character were placed in the field's last character position.

Clear to End of Field

Path:	Config/Emul - Wand
Description:	Clears to the end of a data field (EOF).
Range:	Clear No Clear
Default:	Clear
Notes:	The Short Scan parameter must be activated in order for this parameter to be active. When Clear to End of Field is selected, the PTC nulls out the field that is not filled by a short bar code.

Enable Scanner on Light Pen Enabled Field (5250)

Path:	Config/Emul - Wand
Description:	Enables bar-code scanning for only those fields defined as light pen enabled by the host application.
Range:	Light Pen All Fields
Default:	All Fields
Notes:	None

Auto Key Upon Scan (5250)

Path:	Config/Emul - Wand
Description:	Specifies whether a function key is simulated after scanned data is read.
Range:	None Field Exit Enter Both
Default:	None
Notes:	None

Auto Send (3270)

Path:	Config/Emul - Wand
Description:	Specifies which 3270 data fields are sent automatically to the host.
Range:	None Scanned High Highlighted All Scanned All
Default:	None
Notes:	The auto sends field data is automatically sent to the host when it is entered.

Wand Type

Path:	Config/Emul - Wand
Description:	Specifies the PTC's bar-code scanner type.
Range:	None Pencil Laser RS-232 None
Default:	None
Notes:	None

Wand Sequencing

Path:	Config/Emul - Wand
Description:	Enables PTC wand sequencing.
Range:	Disable Enable
Default:	Disable
Notes:	When this parameter is enabled, the PTC scans bar code sequences that it interprets as keys or key sequences from the keyboard. For example, scanning \$E is the same as pressing the PTC's ENTER key. See Appendix B for a list of wand sequences and their keyboard equivalents for A_{IR}V_U TN 3270 and A_{IR}V_U TN 5250 emulations.

Shuffle Barcode Order

Path:	Config/Emul - Wand
Description:	Determines whether the order of the bar codes recognized are shuffled or kept in the order in which they were configured.
Range:	Shuffle Keep Order
Default:	Shuffle
Notes:	If shuffle is selected, the last bar code type scanned goes to the top of the list and remains there until a new type is scanned.

Number of Barcodes to Configure

Path:	Config/Emul - Wand
Description:	Specifies the number of barcode types to configure.
Range:	00 - 06
Default:	04
Notes:	The number you specify in this parameter determines the number of Barcode #n configuration screens that display. For example, if you specify 2 barcodes to configure, the configuration steps through two complete Barcode #n configuration screens.

Barcode #n Label Type

Path: Config/Emul - Wand

Description: Specifies the label type for barcode #n

Range: Plessey
Code 2 of 5
UPC
Misc.
Advanced

Default: Misc.

Notes: The configuration screens that display after you select a label type depend on which label type you selected. The first screen that displays is the Barcode #n configuration screen, which differs depending on the label type you selected.

Selecting Plessey displays a Barcode #n configuration screen in which you further define the Plessey label by selecting any of the following:

- Regular
- Alpha
- ISBN
- Pure
- Sainsbury

Selecting Code 2 of 5 displays a Barcode #n configuration screen in which you further define the Code 2 of 5 label by selecting any of the following:

- I.D. Industrial
- Discrete
- Interleaved
- Industrial
- Matrix

Selecting UPC displays a Barcode #n configuration screen in which you further define the UPC label by selecting any of the following:

- A&E
- EAN-8, EAN-13
- A, E, EAN-8/13

Selecting Misc. displays a Barcode #n configuration screen in which you define any of the following miscellaneous barcodes:

- Codabar
- Code 39
- Code 128

Selecting Advanced displays a Barcode #n configuration screen in which you define the advanced barcode label.

After further defining the barcode, the wand configuration process continues by displaying the following screens that are common to any selection you made (except Advanced):

- Label Length
- Generic Options
- Label Options
- Drop First
- Drop Last

When you make selections in each of these screens, the process repeats for the next barcode #n.

Barcode #n Label Length

Path:	Config/Emul - Wand
Description:	Sets the length of the label selected in the Barcode (n) Label Type parameter.
Range:	00 - 64 decimal characters
Default:	0
Notes:	Label length includes start and stop characters, check digits, and data characters. A value of 0 allows barcodes of any length.

Barcode #n Generic Options

Path:	Config/Emul - Wand
Description:	Determines the laser redundancy checking, character build tightening, guard tightening, and bump-in process in the Advanced options setting of the Barcode (n) Label Type parameter.
Range:	The Generic Options settings apply to the barcode indicated in the following table.

Bit #	Cleared	Set
UPC/EAN		
0	No laser redundancy check	Laser redundancy check
1	No character build tighten	Character build tighten
2	No guard tighten	Guard tighten (UPCA, EAN8, and EAN13 only and if exact # of counts)

Bit #	Cleared	Set
3	Normal bump-in, 5 tries	Bump-in=(total # of bar)/(space pairs) - (# of bar)/(space pairs in the label)
4	Normal bump-in, 5 tries	Exact # of counts
6	No AIM symbol ID returned	AIM symbol ID returned
Plessey		
0	No laser redundancy check	Laser redundancy check
1	No character build tighten	Character build tighten and guard tighten for regular, ISBN, and Alpha
2	No guard tighten	Guard tighten for regular, ISBN, and Alpha
4	One bar bump-in	Exact # counts no bump-in allowed
6	No AIM symbol ID returned	AIM symbol symbol ID returned
Codabar		
0	No laser redundancy check	Laser redundancy check
1	No character build tighten	Character build tighten
4	Normal bump-in, 3 tries	Exact # counts no bump-in allowed
6	No AIM symbol ID returned	AIM symbol ID returned

Bit #	Cleared	Set
Code 39		
0	No laser redundancy check	Laser redundancy check
1	No character build tighten	Character build tighten
3	Normal bump-in, 5 tries	Expand bump-in, 15 tries
4	Normal bump-in, 5 tries	Exact # counts no bump-in allowed
5	Normal character build	Special character build
6	No AIM symbol ID returned	AIM symbol ID returned

Code 128		
0	No laser redundancy check	Laser redundancy check
3	Normal bump-in, 6 tries	Expanded bump-in, 40 tries
4	Normal bump-in, 6 tries	Exact # counts, no bump-in allowed
6	No AIM symbol ID returned	AIM symbol ID returned

Code 2 of 5		
0	No laser redundancy check	Laser redundancy check
1	No character build tighten	Character build tighten
6	No AIM symbol ID returned	AIM symbol ID returned

Default: None

Notes:

The Generic Options setting is made by adjusting the specified bit of the Generic Options byte in the Bar-code (n) Label Type Advanced Settings screen.

When the laser redundancy check is enabled, the wand software returns a good scan only if two consecutive scans decode the same.

For most bar-code types, character build tightening requires labels to meet more strict specification requirements.

Guard tightening applies only to Plessey and UPC labels. When enabled, guard tightening checks the existence and correctness of the label's guards.

Bump-in tightening applies only when the decoding software has difficulty finding the beginning of the label, a problem that occurs if black spots or smudges are obscuring the beginning of the bar code. Bump-in specifies the number of times the software attempts to “bump” past the extraneous markings to find the beginning of the label. The number of attempts varies with each bar-code type.

Label Options

Path: Config/Emul - Wand

Description: Sets the options for the selected label

Range: The Generic Options settings apply to the barcode indicated in the following table.

Bit#	Cleared	Set
UPC/EAN		
0	Ignore 2-digit addon	Do 2-digit addon
1	Ignore 5-digit addon	Do 5-digit addon

The next two bits form options for UPCE system number selection

2	00- Do not test UPC-E system	
	01- Only allow system 1 UPC-E	
3	11- Only allow system 0 UPC-E	
	11- Do test but allow both 0 & 1	
4	Normal UPC-E	Expand UPC-E to UPC-A
5	Normal UPC	Expand all to EAN-13
6	Add-on - forward only	Add-on - bidirectional
7	Do check digit check	No check digit check

Plessey

The first two bits form the check digit options for regular, ISBN, and Alpha labels.

0	00 - No check digits	
	01 - Do 1 check digit check	
1	10 - No 2 check digit check	
	11 - Do 2 check digit checks	

Bit#	Cleared	Set
2	All 0 label is illegal for regular, ISBN, and Alpha	All 0 label is legal for regular, ISBN, and Alpha
3	Alpha & ISBN - : through ?	Alpha & ISBN - A through F

Codabar

0	Normal Codabar	Numeric labels only
1	No check digit check	Do check digit check

Code 39

0	No check digit check	Do check digit check
1	Ignore MIL-1189B spec	Allow MIL-1189B spec
2	Ignore AIM Extended C-39	Allow AIM Extended C-39

Code 128

0	No value for function characters returned	81h-84h returned for characters fn1-fn4
---	---	---

Code 2 of 5

0	No interleaved check digit check	Do interleaved check digit check
1	No trailing null space character pad on interleaved	Allow trailing null space character pad on interleaved
2	Ignore ITF-14/6	Allow ITF-14/6

Default: None

Notes: If the label has no configurable options, a no options available message displays.

Drop First

Path:	Config/Emul - Wand
Description:	Determines the number of characters to drop from the beginning of the label specified in the Barcode (n) Label Type parameter.
Range:	0-15 decimal characters
Default:	1
Notes:	See also: Drop Last

Drop Last

Path:	Config/Emul - Wand
Description:	Specifies the number of characters to drop from the end of a successful scan of the label specified in the Barcode (n) Label Type parameter.
Range:	0-15 decimal characters
Default:	1
Notes:	See also: Drop First



Host information 4

This chapter provides information about host issues pertaining to AIRVU TN 3270/TN 5250. Configuration procedures are not covered in this chapter; refer to your host system manuals for this information.

AS/400 TCP/IP notes

Returning to the application from sleep mode

PTCs and PBCs that go into sleep mode in a TCP/IP environment do not automatically return to the point in the application that they were in when they entered the sleep mode. When turned back on, the PTC or PBC returns to the application at the login screen level.

This situation can be alleviated by adjusting the TCP keep alive (TCPKEEPALV) parameter on the AS/400 host. TCPKEEPALV specifies the amount of time in minutes that the host TCP/IP waits before sending out a probe to the TCP/IP on the PTC. The probe is sent when the connection is otherwise idle, even when there is no data to be sent. PTCs that are powered off cannot respond, so the host terminates their connection.

On the AS/400, access the TCPKEEPALV parameter from the Change TCP/IP Attributes command. The minimum value of 40320 minutes equals 672 hours. Change this setting to one that equals or exceeds an average session time for your system.

A typical Change TCP/IP Attribute screen is shown on the [next page](#).

Change TCP/IP Attributes (CHGTCPA)		
Type choices, press Enter.		
TCP keep alive	120	1-40320, *SAME, *DFT
TCP urgent pointer *	BSD	SAME, *BSD, *RFC
TCP receive buffer size	8192	512-83888068, *SAME, *DFT
TCP send buffer size	8192	512-83888608, *SAME, *DFT
UDP checksum *	YES	*SAME, *YES, *NO
IP datagram forwarding	*NO	*SAME, *YES, *NO
IP reassembly timeout	120	60-120, *SAME, *DFT
IP time to live	64	1-512, *SAME, *DFT
ARP cache timeout	5	1-1440, *SAME, *DFT
Log protocol errors	*NO	*SAME, *YES, *NO

Another AS/400s settings that must be changed is the Inactivity Timeout (INACTTIMO), accessed from the Change TELNET Attributes (CHGTELNA) screen.

The system may wait an additional 1 to 120 seconds to end the inactive connection.

The Inactivity Timeout setting specifies the number of seconds the system allows a TELNET connection to remain inactive before it is ended. When a TELNET connections is inactive longer than the time specified by this setting, it is ended. Change this setting to one that is appropriate for your system.

A typical Change Telnet Attributes screen is shown on the [following page](#).

Change TELNET Attributes (CHTELNA)

Type choices, press Enter.

Autostart server	*YES	*YES, *NO, *SAME
Inactivity timeout	0	0-2147483647, *SAME, *DFT
Timemark timeout	600	0-2147483647, *SAME, *DFT
Default NVT type	*VT100	*SAME, *VT100, *NVT
Coded character set identifier	*MULTINAT	1-65533, *SAME, *MULTINAT
ASCII fullscreen mapping:		
Outgoing EBCDIC/ASCII table	*CCSID	Name, *SAME, *CCSID, *DFT
Library	Name,	*LIBL, *CURLIB
Incoming ASCII/EBCDIC table	*CCSID	Name, *SAME, *CCSID, *DFT
Library	Name, *LIBL,	*CURLIB



Beginning and ending a session 5

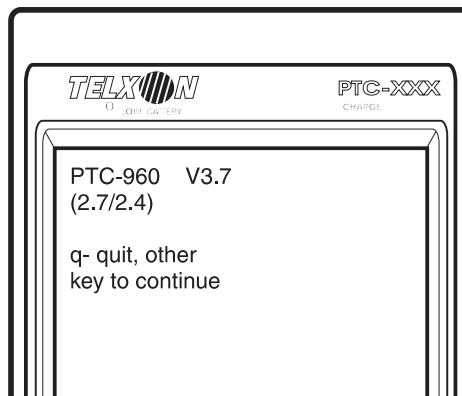
When switching to or from SNA or TN, run EDisk 2. When switching from numeric to alphabetic host IP, run EDisk.

This chapter explains how to begin an AirVU TN 3270 or TN 5250 terminal emulation session, how to exit the session, and how to interpret session status line messages.

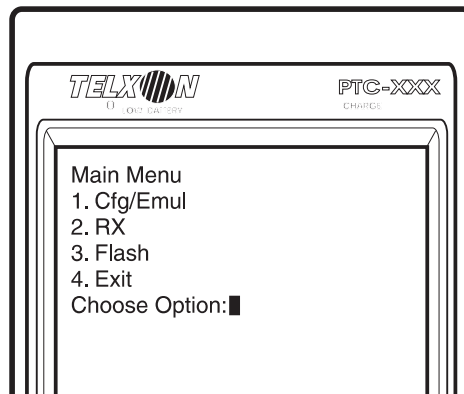
Beginning the emulation session

Use the following procedure to begin an AirVU TN emulation session.

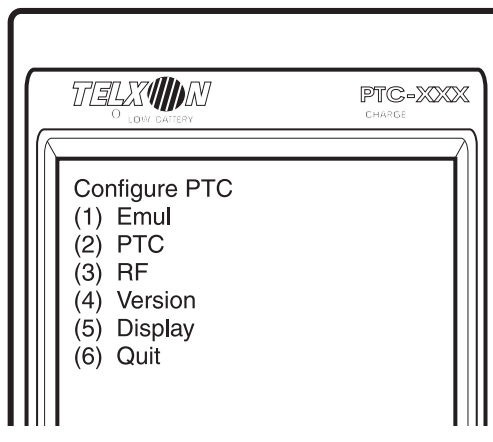
1. Press the PTC's ON/OFF key to turn on the PTC. The screen shows the following message as shown in the following illustration.



2. Press any key to begin. Several operational messages appear, and after a few seconds, the Main Menu displays as shown in the illustration below.

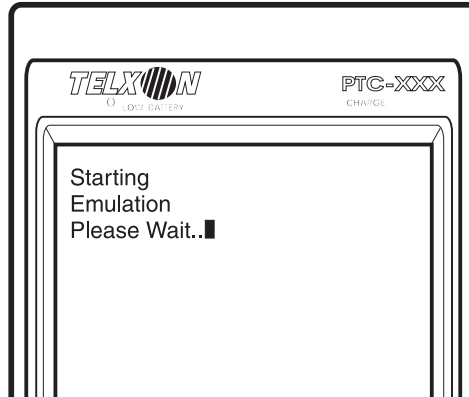


3. At the Main Menu, select Cfg/Emul. The Configure PTC Menu displays as shown in the next illustration.



4. Select the Emul option at the Configure PTC menu. The screen shows identification, version number, and copyright information. While the PTC attempts to establish communication with

the host, the screen displays the following message as shown in the illustration below.

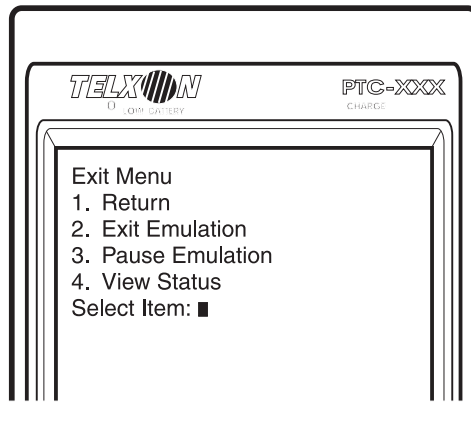


After the PTC establishes the communication link, the first emulation screen (a menu, data entry screen, and so on) from the host displays on the PTC. You can now begin the emulation session.

Exiting an emulation session

Follow these steps to exit the emulation session.

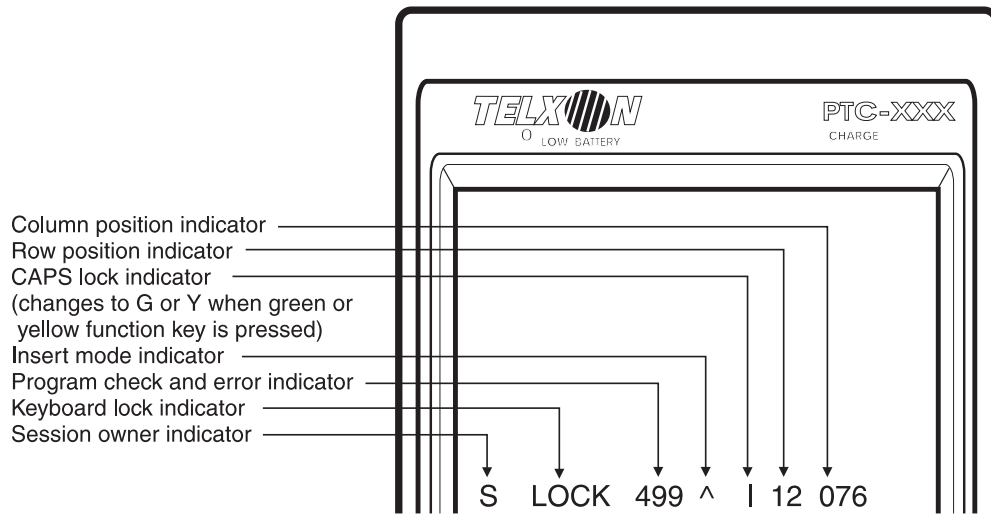
1. With the emulation application running on the PTC, press the green function M key sequence on the PTC's keyboard (green FUNC - Q on the PTC-912). The Exit Emulation Menu displays as shown in the illustration on the [following page](#).



2. To pause the emulation session, press the 3 key. The system searches the directory for the pause file (PAUSE_ES.EXE) to pause. If this file is not found, the PTC immediately returns to the emulation session.
3. To view the configuration parameters, press the 4 key. You can view the configuration program's parameters but you cannot make changes to them. When you finish viewing status, press any key to return to the Exit Emulation Menu.
4. To exit the emulation session, press the 2 key. The Configure PTC Menu displays.

Interpreting the PTC's status line

You can monitor an emulation session's status by viewing the status line that displays in the screen's bottom line. You can toggle the status off and on by pressing the STAT key sequence. The status line that displays provides information about the status of the emulation session and the current cursor location relative to a conventional **AIRVU** TN screen. The following illustration shows an example of a status line that might display during an emulation session (a PTC-860 screen is used in this example).



The session owner indicator shows the current session state from the host's perspective. You may often encounter the unowned state during power on/off sequences. The SSCP-LU (system service control point logical unit) session is used when the operator is communicating with the SSCP. The LULU (logical unit logical unit) session is the one in which most of the data entry is performed. The session states are:

?	Unowned state
I	Inactive state
S	SSCP-LU state
J	LULU state

Keyboard lock indicator

The keyboard lock indicator shows you when the host is ready to accept data input. The status line shows the following:

Note: " " indicates blank status line positions.

" "	OK to enter data
"LOCK"	The keyboard is locked except for special keys (EXIT, LCD, LIGHT). On the PTC-925 and 16-column mode PTC-860, PTC-960, and PTC-912, this status condition displays as "L."

Program check and error indicator

The program check and error indicator shows AIRVU TN and communication checks as well as other detected errors. This indicator usually shows a four digit code for the specific error. For a list of AIRVU TN error codes and corresponding error messages, see [Chapter 7, "Resolving problems"](#).

Insert mode indicator

The insert mode indicator shows the state of the PTC's insert mode. You can toggle it on and off with the INS key sequence. This indicator can be one of the following:

“ ”	Insert mode is off
^	Insert mode is on

CAPS lock indicator

The caps lock indicator shows the state of the CAPS lock function. You can toggle the CAPS lock function on and off using the CAPS key sequence (see [Appendix B](#)). The CAPS lock indicators are:

“ ”	CAPS mode is off
↑	CAPS or SHIFT mode is on (3278)
A	CAPS mode is on (5250)
↑	SHIFT mode is on (5250)

Function key indicator

The function key indicator shows when either of the function keys is pressed. This indicator occupies the same character position as the CAPS lock indicator, replacing it with a function key indicator whenever you press a function key.

G	Indicates that the green function key has been pressed
Y	Indicates that the yellow function key has been pressed

Row position indicator

The row position indicator shows the current row position of the cursor. The range of values depends on the AIRVU TN terminal mode configured on the host. Valid ranges are from 01 to 27.

01	Indicates that the cursor is in row 1
17	Indicates that the cursor is in row 17

Column position indicator

The column position indicator shows the current column position of the cursor. The range of values depends on the AIRVU TN terminal model configured by the host. Valid ranges are from 001 to 132.

001	Indicates that the cursor is on column 1
080	Indicates that the cursor is on column 80

Rebooting the PTC

If the PTC is 3-keyed, the keyboard is mapped to a DOS keyboard. Once at the DOS prompt, pressing Ctrl Alt Delete reboots the unit and invokes the emulation program. The table on the [following page](#) shows DOS keys and their equivalent emulation keys.

Rebooting a PTC-870IM

The OFF/ON button on a PTC-870IM does not turn the unit completely off, it places it in the sleep mode. If the unit ever locks up, you can reboot it using the following procedure:

1. Press and hold the CONTRAST UP and ON/OFF buttons.
2. Release the CONTRAST UP button while still holding the ON/OFF button.
3. Press and release the CONTRAST UP button.

4. Release the ON/OFF button.
5. Press and release the ON/OFF button.

The unit should take about 10 seconds to boot.

Use the following table to boot the unit from the MS-DOS prompt.

DOS Keys	PTC-860	PTC-960	PTC-860IM	PTC-870IM	PTC-912
ALT	GREEN FUNC	GREEN FUNC	PAGE UP	YELLOW FUNC	FLD+ (TAB)
CTRL	DASH	DASH	GREEN FUNC	GREEN FUNC	GREEN FUNC
DEL	ENTER GREEN FUNC	DEL	PAGE DOWN	DEL	SHIFT FLD+ (TAB)
. (period)	ENTER W	ENTER W	PAGE LEFT W		YELLOW FUNC R
: (colon)	ENTER N	ENTER N	PAGE LEFT N		YELLOW FUNC G
_ (under- score)	ENTER F	ENTER F	PAGE LEFT F		YELLOW FUNC O
\ (backslash)	ENTER C	ENTER C	PAGE LEFT C		YELLOW FUNC A
* (star)	YELL, FUNC 8	YELL, FUNC 8	DASH 8		X 8
(or, pipe)	ENTER D	ENTER D	PAGE LEFT D		YELLOW FUNC B



Using PTCs as terminals 6

This chapter describes the PTC keyboard functions in AIRVU (TN 3270 or TN 5250) terminal emulation. It also explains how to use the PTC keys to provide access to all of the data that would display on a conventional AIRVU screen.

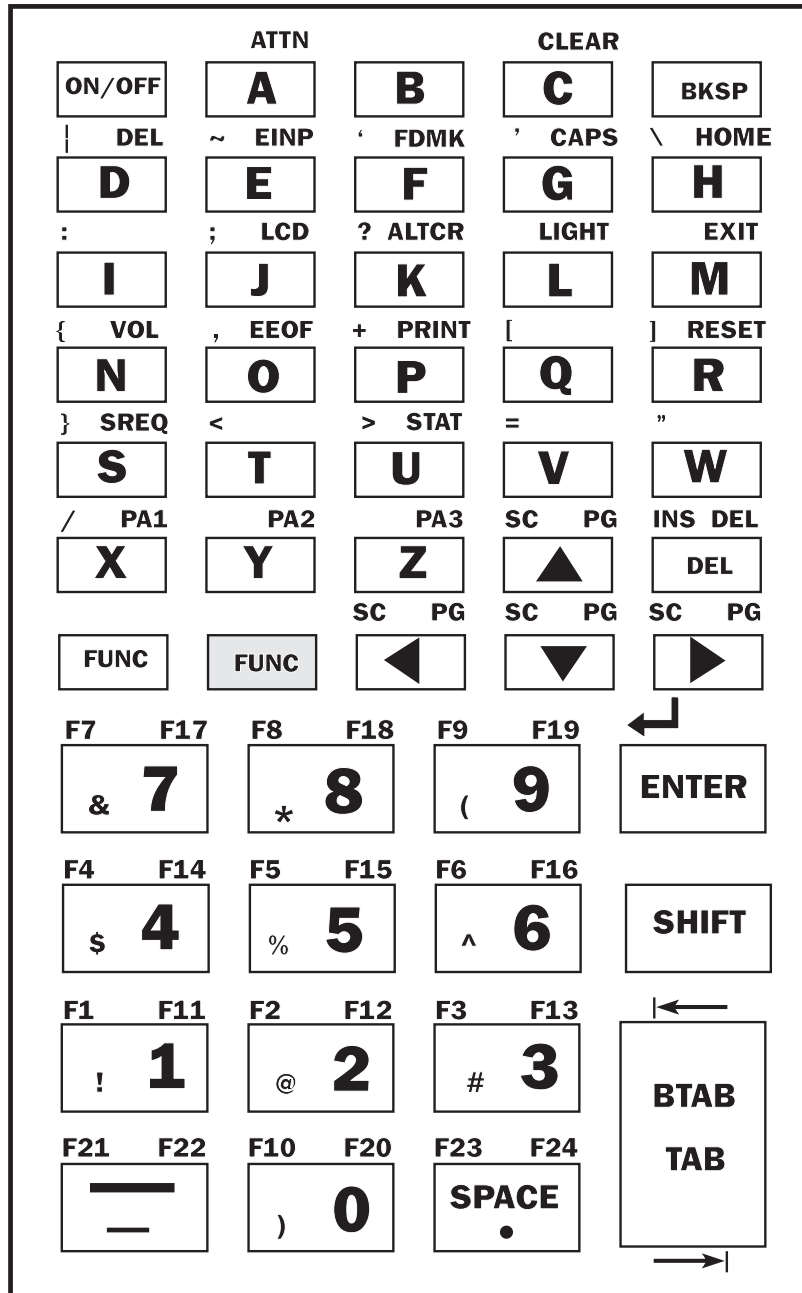
General keyboard information

AIRVU TN 3270 or TN 5250 takes advantage of the PTC's ability to assign more than one function to each of its keys. Conventional AIRVU TN key functions can be assigned to a key or a key sequence on the PTC's keyboard. The PTC also assigns PTC-specific functions to other key sequences to provide more control over the way the PTC functions during a AIRVU TN application. The illustration on the [following page](#) shows an example PTC keyboard (a PTC-860) configured for the AIRVU TN System.

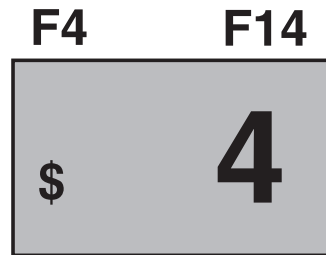
[Appendix A](#) shows keyboards for all PTC models used with AIRVU TN. Some of the PTC's keys have one symbol printed directly on the key, for example the J key in the illustration below.



This key has two additional functions printed above it.



Other keys have two symbols printed on them. For example, the 4 key has the \$ symbol printed on the left as shown in the illustration below.



All of the PTC number keys have two functions printed on them. They also have two symbols or functions printed above them on the keyboard overlay.

On the example keys, both the J and the 4 key have four separate functions in the AirVu TN System.

The J, like all other letter keys, has only one symbol printed on it, but this symbol represents two functions: it lets you enter either an uppercase or a lowercase J at the PTC screen. The two symbols printed above the key (the “,” symbol and LCD) define two other J key functions.

The 4 key has two functions printed on it (you can enter the number 4 or the \$ symbol). The two symbols printed above the key (F4 and F14) are program-defined function keys.

The maximum number of functions per key is four, although not every key has the maximum number of assigned functions. A typical four-function key can use each of the keyboard's four operating modes:

- the nonshift mode,
- the shift mode,
- the green FUNC (function) mode, and

- the yellow FUNC (function) mode.

To use the PTC's two-function, three-function, and four-function keys, you must invoke the specific operating mode required for the desired key function.

The following table shows how to activate keyboard modes.

Keyboard mode	How to activate
Nonshift mode	Press the key with the desired function or symbol printed on it. For example, to enter a lower-case J, press the J key. To enter 4, press the 4 key.
Shift mode	Press the PTC's blue SHIFT key before you press the key with the desired symbol or function printed on it in blue. For example, to enter an uppercase J, press the SHIFT key and then the J key. Press the SHIFT key before the 4 key to enter a \$ symbol. Note: Although the letter keys do have a shift mode function, no blue symbol appears on the key.
Yellow Func mode	Press the yellow FUNC key before you press the key with the desired function or symbol printed above it in yellow to use the yellow function mode. For example, pressing the yellow FUNC key before you press the J key enters a ";" (semicolon) symbol. Pressing the yellow FUNC key and then the 4 key invokes the program-defined F4 function.
Green Func mode	Press the green FUNC key before you press the key with the desired function or symbol printed above it in green. For example, pressing the green FUNC key before you press the J key invokes the PTC's LCD function. Pressing the green FUNC key and then the 4 key invokes the program-defined F14 function.

When using shift and function mode key sequences, be sure to press the SHIFT or FUNC key first, and then press the key with the desired function or symbol. If you try to press two keys simultaneously, the PTC will beep or perform the function of one of the individual keys you pressed.

The ON/OFF, SHIFT, and FUNC keys have only nonshift mode functions.

Using the nonshift key mode

The nonshift mode is like the nonshift mode on a typewriter or computer keyboard. Nonshifted keys are usually lower-case letters and numbers. The nonshift key symbols for letter keys are printed on the key (in white or black, depending on the unit) and the symbols for number keys are printed in the bottom right corner of the key (also in white). The nonshift mode is the only one that does not require you to press a key sequence. You can enter the number, letter, or symbol or access a function by pressing the desired key.

Using the blue shift key mode

The shift mode is like the shift mode on a typewriter or computer keyboard. Pressing the blue SHIFT key puts you into shift mode. When you want to enter an uppercase letter or a symbol that appears on the left side of a number key, press the SHIFT key first, and then press the key with the desired symbol or function printed in blue on it. For example, if you press the SHIFT key and then the J key, an upper-case J displays. If you press the SHIFT key and then the 4 key, the \$ symbol displays.

When you press the SHIFT key, only the key you press immediately after the SHIFT will be in shift mode. When you want to enter a shift mode character or function, press the SHIFT key to enter shift mode, then press the key with the desired shift mode symbol or function printed on it (this enters the letter or symbol); the PTC returns to the nonshift mode with the next key stroke.

Each time you want to enter a shift mode character or access a shift mode function, you must press the SHIFT key prior to pressing the desired shift mode key.

Using the yellow FUNC key

Most of the PTC's keys have a third function shown in yellow above the key. On the letter keys these "yellow" functions are characters, and on the number keys they are program-defined function keys (F1, F2, and so on). Enter the symbols or activate the functions by pressing the yellow FUNC key and then pressing the key with the desired symbol or function above it in yellow. For example, if you press the yellow FUNC key and then the J key, a semicolon displays. If you press the yellow FUNC key and then the 4 key, the PTC performs the function that corresponds with the F4 key.

Using the green FUNC key

Many keys have a fourth key function. This function's name is shown in green above each key that has a defined fourth function. On the letter keys, "green" functions are system-defined functions (ATTN, PRINT, RESET, and so on). On the number keys, green function keys are program-defined functions (F11, F12, F13, and so on). To perform a green function, press the green FUNC key (to the right of the yellow FUNC key), and then press the key that has the desired green function above it. For example, if you press the green FUNC key and then the J key, the LCD function is invoked. Pressing this key sequence lets you set the desired level of PTC screen contrast. Pressing the green FUNC key and then the 4 key accesses the function associated with the F14 key.

Terminal emulation editing keys

The PTC's editing keys let you modify data and enter data into unprotected fields. Trying to use these keys in protected fields causes the PTC to beep.

PTC editing keys

Delete (DEL) key

Pressing the DEL (delete) key sequence deletes the character at the current cursor position. The characters to the right of the deleted character shift one column left to fill the space left by the deleted character.

Insert (INS) key

Pressing the INS key sequence puts the PTC into insert mode. The PTC remains in the insert mode until you press the INS key sequence again.

Pressing the INS key sequence lets you insert a character at the current cursor position without deleting the character already in that position. Each time you press a key in the insert mode, the character at the cursor position and all characters to the right of it move one column to the right to make room for the new character you insert. If the cursor is at a null character position, pressing an alphanumeric key in the insert mode inserts the new character without shifting any characters.

If no more room exists in the field for the insertion of characters, the PTC will beep each time you try to insert a character.

AIRVU TN terminal emulation function keys

The AIRVU TN PTCs have keys and key sequences that let you enter data and perform functions as you would on a conventional AIRVU TN terminal to control an emulation session. The terminal emulation function keys include:

- Alternate Cursor
- Attention (ATTN) key
- Clear (CLEAR) key
- Erase Input (EINP) key
- Home (HOME) key
- Reset (RESET) key
- System Request (SREQ) key

For a description of these keys and their functions, see the user's guide for the terminal emulation application.

PTC utility keys

The AIRVU TN PTC has several PTC utility keys specific to PTC-based terminal emulation. Using such keys only changes PTC operational features and does not affect emulation status or data. These keys control the PTC's cursor, backlight, and its LCD screen contrast. Conventional terminals do not have these keys

Exit Emulation (EXIT) key

Pressing the EXIT key sequence lets you exit the emulation session and return to the AIRVU TN Main Menu.

The Status Line key applies to PTCs only; it does not apply to pen-based units.

Status Line (STAT) key

Pressing the STATUS key on a PTC toggles the status line on or off. The STATUS key is a Telxon-specific key.

Turn on Backlight (LIGHT) key

Pressing the LIGHT key sequence toggles the PTC's backlight on and off (if the PTC has a backlight).

LCD Adjust (LCD) key

Pressing the LCD key sequence selects the PTC's LCD (liquid crystal display) brightness. Each time you press the LCD key sequence, the PTC's screen becomes more or less bright, depending on the screen's current level of brightness. Pressing this sequence when the screen is at its least bright contrast, "wraps" to the brightest contrast. Pressing the LCD key sequence at the brightest contrast causes the screen to darken incrementally.

Cursor control keys

You can use the PTC's cursor control keys to move the cursor on the PTC's screen during a terminal emulation session. These cursor control keys include:

- the FLD + and FLD - keys (5250 only)
- the TAB key,
- the Back TAB (BTAB) key,
- the New Line (↵) key,
- the Up Arrow (↑) key,
- the Down Arrow (↓) key,
- the Right Arrow (→) key, and
- the Left Arrow (←) key.

The following sections describe each of the cursor control keys.

FLD+ and FLD- keys (TN 5250 only)

Entry of the FLD+ and FLD- keys are only allowed inside fields. Entry of FLD- is only allowed in numeric, digits only, or signed numeric fields.

The FLD+ and FLD- keys move the PTC's cursor to the next unprotected field on the screen and put the cursor at the first character position in this field. Pressing the FLD+ key after entering a value, records the value as positive, and pressing the FLD- keys records the value as negative. When you press either of these keys before the cursor is at the end of a field, the rest of the field fills with nulls, and the cursor moves to the following field. These keys work like a TAB key with a clear-to-the-end-of-the-field function.

TAB key

The TAB key moves the PTC's cursor to the next unprotected field on the screen and puts the cursor at the first character position in this field.

Back TAB (BTAB) key

If the cursor is not in the first position of the current field, it will be put there.

The BTAB key sequence moves the cursor to the preceding unprotected entry field on the screen and puts the cursor at the first character position in this field. If the cursor is at the first unprotected field, the cursor will be placed at the first character position of the last field.

New Line (↵) key

In TN 5250 emulation, the cursor is moved to the first position of the next line. If it is not in a field, the cursor will be moved to the first position of the next field.

The ↵ key sequence moves the cursor to the first character in the first unprotected entry field in the next line. If the screen has no unprotected fields, the cursor moves to location 1 of that line.

On the 16-line PTC-960 you must press the Yellow FUNC, SHIFT, and Q keys for the Up Arrow function. There is a similar mode for the PTC-912.

Up Arrow (↑) key

Each time you press the Up Arrow key (the non-shifted mode), the PTC's cursor moves up one row on the PTC's screen. When the cursor reaches the top row of the screen, pressing the Up Arrow key once more wraps the cursor to the bottom row.

Pressing the green FUNC key before you press the Up Arrow key puts you in pan mode. In this mode, the viewport pans up the screen without the PTC's cursor moving (see the section [“Using the scroll keys”](#)).

Down Arrow (↓) key

Each time you press the Down Arrow key (the non-shifted mode), the PTC's cursor maintains its column position but moves down one line on the PTC's screen. When the cursor reaches the bottom row of the screen, pressing the Down Arrow key once more wraps the cursor to the top row.

Pressing the green FUNC key before you press the Down Arrow key puts you in pan mode. In this mode, the viewport pans down the screen without the PTC's cursor moving (see the section, [“Using the Scroll Keys”](#)).

Right Arrow (→) key

Each time you press the Right Arrow key (the non-shifted mode), the PTC's cursor maintains its row position but moves one column to the right on the screen. When the cursor reaches the last column of the screen, pressing the Right Arrow key once more wraps the cursor to the first column of the next row.

Pressing the green FUNC key before you press the Right Arrow key puts you in pan mode. In this mode, the viewport pans to the right over the screen without the PTC's cursor moving (see the section [“Using the scroll keys”](#)).

Left Arrow (←) key

Each time you press the Left Arrow key (the non-shifted mode), the PTC's cursor maintains its row position but moves one column to the left on the screen. When the cursor reaches the first column of the screen, pressing the Left Arrow key once more wraps the cursor to the last column.

Pressing the green FUNC key before you press the Left Arrow key puts you in pan mode. In this mode, the viewport pans to the left over the screen without the PTC's cursor moving (see the section [“Using the scroll keys”](#)).

Viewing data using the PTC's viewport

The following illustration shows the size of an example PTC screen (PTC-860) relative to the size of a conventional 3270 OR 5250 terminal screen. Even though the PTC's screen size differs from that of the terminal, the PTC takes advantage of its advanced screen management capabilities to let you view, quickly and easily, any data that can display on the terminal screen.

In a conventional system, the host computer sends an application screen to the terminal and application data displays on the terminal's screen. For the application in A1R VU TN, the host sends the same screen to the PTC, and the PTC stores this screen as a virtual screen in its memory. All the data on a full A1R VU TN screen exists in the PTC's memory. You can display this data on the PTC screen in segments using specific control keys. Think of the PTC's screen as a port

that can move over the full A_{IR}V_U TN screen, stopping over desired parts of the A_{IR}V_U TN screen to let you view and enter data.

BMIT FN: INQU		ITEM MASTER DATA		DATE:	
ITEM NO: E/C NO:		COMP NO:		PREF: SUFF:	
DESCRIPTION DATA		DATA		DESCRIPTION	
ITEM DESCRIPTION ITEM TYPE BUYER PLANNER CODE ISSUE CONTROL SCHEDULING CONTROL AUTHORIZATION SHORT RELEASE OPTION ROUTING NUMBER SECONDARY KEY ITEM COMMODITY CODE LOW LEVEL CODE				UNIT OF MEASURE CURRENT REVISION LEVEL RECEIPT CONTROL PRIORITY CODE HORIZON CATEGORY PURCH. RELEASE OPTION ROUTING SUFFIX SALES CODE INSPECTION CODE	
FUNCTION CODE: INQU/BWSE -DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM					

In the above illustration and those that follow, the PTC's viewport is shown as a shaded box. The cursor position is shown as a small, black rectangle inside the viewport.

This viewport can scroll through all of the A_{IR}V_U TN screen data and show the data in the viewport. Using simple cursor control keys and key sequences, you have total control over the data that can display in the PTC's viewport. This guide will discuss the keys and key sequences you can use to move desired data to the viewport.

Field-to-field cursor movement

Earlier in this section the TAB, BTAB (Back TAB) and ↵ (New Line) keys were discussed briefly. Now these keys will be discussed in relation to the PTC's viewport. In a conventional terminal, the TAB key moves the cursor to the next unprotected field (a field at

which you can enter data). The TAB key on the PTC does the same thing. However, when the next unprotected field is not currently in the viewport, pressing the TAB key may scroll the A_{IR}V_U TN screen in any direction to present the next field. For example, in the next illustration, the PTC's viewport is in its initial position after it has logged onto the A_{IR}V_U TN System. It shows the first data item (ITEM NO.).

BMIT FN: INQU	ITEM MASTER DATA		DATE:
ITEM NO: ■ E/C NO:	COMP NO:	PREF:	SUFF:
DESCRIPTION DATA	DATA	DESCRIPTION	
ITEM DESCRIPTION ITEM TYPE BUYER PLANNER CODE ISSUE CONTROL SCHEDULING CONTROL AUTHORIZATION SHORT RELEASE OPTION ROUTING NUMBER SECONDARY KEY ITEM COMMODITY CODE LOW LEVEL CODE	UNIT OF MEASURE CURRENT REVISION LEVEL RECEIPT CONTROL PRIORITY CODE HORIZON CATEGORY PURCH. RELEASE OPTION ROUTING SUFFIX SALES CODE INSPECTION CODE		
FUNCTION CODE: INQU/BWSE -DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM			

After you enter the item number and press the TAB key, the viewport's cursor moves to the next unprotected field on the screen, which is SUFF:. If you compare the two previous illustrations, you see that pressing the Tab key moves the PTC's viewport to show a different section of the A_{IR}V_U TN screen. It appears as if the viewport moves to the right, showing new data and scrolling its original data off at the left.

BMIT FN: INQU		ITEM MASTER DATA		DATE:
ITEM NO:		COMP NO:	PREF:	SUFF: ■
E/C NO:				
DESCRIPTION DATA	DATA	DESCRIPTION		
ITEM DESCRIPTION		UNIT OF MEASURE		
ITEM TYPE		CURRENT REVISION LEVEL		
BUYER PLANNER CODE		RECEIPT CONTROL		
ISSUE CONTROL		PRIORITY CODE		
SCHEDULING CONTROL		HORIZON CATEGORY		
AUTHORIZATION		PURCH. RELEASE OPTION		
SHORT RELEASE OPTION		ROUTING SUFFIX		
ROUTING NUMBER		SALES CODE		
SECONDARY KEY ITEM		INSPECTION CODE		
COMMODITY CODE				
LOW LEVEL CODE				
FUNCTION CODE: INQU/BWSE -DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM				

If the cursor's current position and the first character position of its previous field both display within the same viewport, the cursor moves to this previous field without the viewport's changing position.

The PTC's BTAB key is the opposite of the TAB key. When you press the BTAB key, it moves the previous unprotected field into the PTC's viewport. If the previous field is not within the PTC's current viewport, the viewport scrolls the A_{IR}V_U TN screen to reveal the previous data field. The cursor appears to move in one direction as the viewport scrolls the A_{IR}V_U TN screen in the other direction.

Pressing the New Line key(↵) moves the PTC's cursor to the next unprotected data field on a new line. If that unprotected field already appears within the current viewport, the cursor moves directly to the field, and the position of the viewport does not change. If this next field is not currently in the PTC's viewport, the viewport "moves" to the field, scrolling the A_{IR}V_U TN screen.

Using the arrow keys

The PTC has four arrow (cursor control) keys on its keyboard: the Left Arrow (←), Right Arrow (→), Up Arrow (↑), and Down Arrow (↓). These four keys control the movement of the PTC's cursor in the viewport.

Pressing an arrow key once moves the cursor one column or line in the direction of the arrow (left, right, up, or down). Continuing to press this key moves the cursor additional columns or lines in the same direction. When the cursor reaches the viewport's boundary, continued pressing of the arrow key changes the viewport's position on the virtual A_{IR}V_U TN screen.

When your PTC cursor is at the top, bottom, left, or right boundary of the viewport, pressing an arrow key scrolls new A_{IR}V_U TN screen information into the viewport in the direction of the arrow key you press. For example, if the cursor is at the right boundary of the viewport, and you press the Right Arrow key, the A_{IR}V_U TN screen information at the viewport's left boundary scrolls off as new A_{IR}V_U TN screen information displays at the right. The viewport appears to move to the right as you press the Right Arrow key as shown in the illustration on the [following page](#).

BMIT FN: INQU		ITEM MASTER DATA		DATE:	
ITEM NO: E/C NO:		COMP NO:		PREF: SUFF:	
DESCRIPTION DATA		DATA		DESCRIPTION	
ITEM DESCRIPTION ITEM TYPE BUYER PLANNER CODE ISSUE CONTROL SCHEDULING CONTROL AUTHORIZATION SHORT RELEASE OPTION ROUTING NUMBER SECONDARY KEY ITEM COMMODITY CODE LOW LEVEL CODE				UNIT OF MEASURE CURRENT REVISION LEVEL RECEIPT CONTROL PRIORITY CODE HORIZON CATEGORY PURCH. RELEASE OPTION ROUTING SUFFIX SALES CODE INSPECTION CODE	
FUNCTION CODE: INQU/BWSE - DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM					

When the cursor is at both the viewport's boundary and the virtual AirVU TN screen's boundary, pressing the arrow key in the direction of the boundary will cause the cursor to wrap to the opposite side of the AirVU TN screen. The viewport will change its position on the AirVU TN screen to show the new cursor position.

For example, if the cursor is at the top line of both the viewport and the AirVU TN screen, pressing the Up Arrow key moves the viewport to the bottom of the AirVU TN screen and displays the information there as shown in the next two illustrations on the [following page](#).

BMIT FN: INQU		ITEM MASTER DATA		DATE:	
ITEM NO: E/C NO:		COMP NO:		PREF: SUFF:	
DESCRIPTION DATA		DATA			
ITEM DESCRIPTION ITEM TYPE BUYER PLANNER CODE ISSUE CONTROL SCHEDULING CONTROL AUTHORIZATION SHORT RELEASE OPTION ROUTING NUMBER SECONDARY KEY ITEM COMMODITY CODE LOW LEVEL CODE				UNIT OF MEASURE CURRENT REVISION LEVEL RECEIPT CONTROL PRIORITY CODE HORIZON CATEGORY PURCH. RELEASE OPTION ROUTING SUFFIX SALES CODE INSPECTION CODE	
FUNCTION CODE: INQU/BWSE -DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM					

BMIT FN: INQU		ITEM MASTER DATA		DATE:	
ITEM NO: E/C NO:		COMP NO:		PREF: SUFF:	
DESCRIPTION DATA		DATA		DESCRIPTION	
ITEM DESCRIPTION ITEM TYPE BUYER PLANNER CODE ISSUE CONTROL SCHEDULING CONTROL AUTHORIZATION SHORT RELEASE OPTION ROUTING NUMBER SECONDARY KEY ITEM COMMODITY CODE LOW LEVEL CODE				UNIT OF MEASURE CURRENT REVISION LEVEL RECEIPT CONTROL PRIORITY CODE HORIZON CATEGORY PURCH. RELEASE OPTION ROUTING SUFFIX SALES CODE INSPECTION CODE	
FUNCTION CODE: INQU/BWSE -DISPLAY CURRENT DATA ISRT - INSERT A NEW ITEM					

Right and Left Arrow Keys

The Right and Left Arrow keys move the cursor from one viewport column to another.

Pressing the Right Arrow key moves the cursor one column to the right. When the cursor is at the last viewport column (and not concurrently in last column of the A_{IR}V_U TN screen), pressing the Right Arrow key scrolls new A_{IR}V_U TN screen information into the viewport from the right and scrolls current A_{IR}V_U TN screen information off the viewport at the left.

When the cursor is in the last column of both the viewport and the A_{IR}V_U TN screen, pressing the Right Arrow key causes the cursor to wrap to the first column position on both the viewport and A_{IR}V_U TN screen. The viewport position changes from the far right to the far left side of the A_{IR}V_U TN screen.

Pressing the Left Arrow key moves the cursor to the left. When the cursor is in the first column position of the viewport (and not concurrently in the first column of the A_{IR}V_U TN screen), pressing the Left Arrow key scrolls new A_{IR}V_U TN screen information onto the viewport from the right and scrolls current A_{IR}V_U TN screen information off the viewport at the right.

When the cursor is in the first column of both the viewport and the A_{IR}V_U TN screen, pressing the Left Arrow key causes the cursor to wrap to the last column position on both the viewport and A_{IR}V_U TN screen. The viewport position changes from the far left to the far right side of the screen.

Up and Down Arrow keys

The Up and Down Arrow keys move the cursor from one viewport line to another.

Each time you press the Up Arrow key, the cursor moves up one line on the viewport. When the cursor is at the first line of the viewport (and not concurrently

in the first line of the virtual A_{IR}V_U TN screen), pressing the Up Arrow key scrolls new A_{IR}V_U TN screen information into the viewport from the top and seems to scroll the current A_{IR}V_U TN screen information off the viewport at the bottom.

When the cursor is in the first line of both the viewport and the A_{IR}V_U TN screen, pressing the Up Arrow key causes the cursor to wrap to the last line of both the viewport and the A_{IR}V_U TN screen, showing new A_{IR}V_U TN screen information on the viewport. The viewport changes position from the top of the A_{IR}V_U TN screen to its bottom.

Pressing the Down Arrow key moves the cursor down one line. When the cursor is in the viewport's last line position (and not concurrently in the last line of the A_{IR}V_U TN screen), pressing the Down Arrow key seems to scroll the viewport down, scrolling new A_{IR}V_U TN screen information into the viewport from the bottom and scrolling the current A_{IR}V_U TN screen information off the viewport at the top.

When the cursor is in the last line of both the viewport and the A_{IR}V_U TN screen, pressing the Down Arrow key causes the cursor to wrap to the first line on both the viewport and the A_{IR}V_U TN screen.

Using the scroll keys

The A_{IR}V_U TN PTCs have a scroll mode that lets you scroll or pan the viewport in a desired direction over the A_{IR}V_U TN screen information, without changing the row and column position of the cursor. While the viewport scrolls or pans over the A_{IR}V_U TN screen information, the cursor maintains the same line and column position on the A_{IR}V_U TN screen as it had just before you entered scroll mode.

To enter the scroll mode, just press the PTC's SC key. When you do this, a special status line, shown in the illustration below, replaces the typical terminal emulation status line:

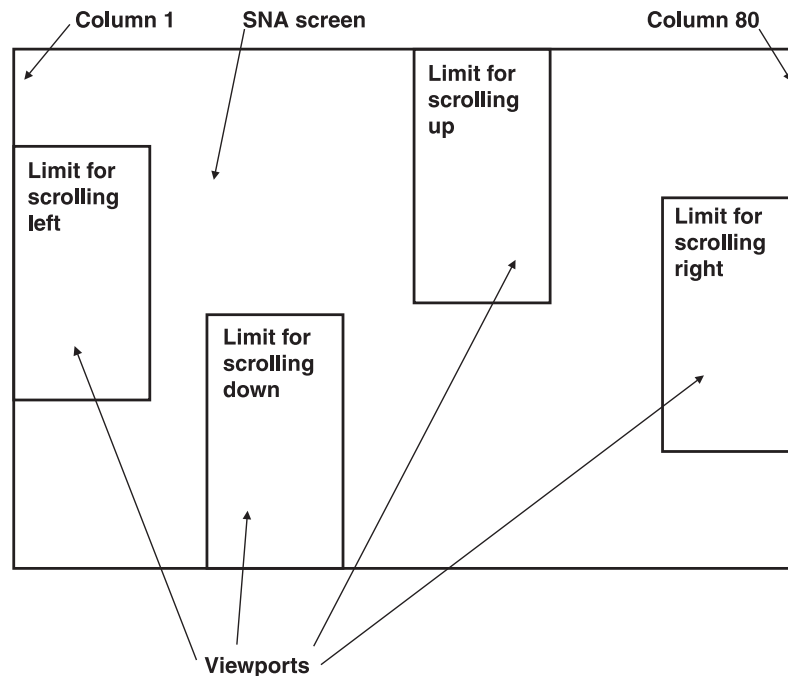


SC ← ↑ ↓ → **ULC:RR CCC**

This status line tells you that you are in the scroll mode (SC) and that you can scroll in all four directions using the required arrow keys. The ULC (upper left corner) values represent the row (RR) and column (CCC) position of the upper left corner of the viewport. When you are finished using the scroll mode, you can press the ENTER key to exit this mode and return to the terminal emulation operating mode.

In the scroll mode, pressing any one of the four cursor control keys lets you pan the viewport (over the A_{IR}V_U TN screen information) in the direction of the arrow key you press. When you press the SC key, the viewport's cursor is locked into its current position (column and line) on the A_{IR}V_U TN screen. The viewport moves in the direction that the cursor would have moved if the PTC had not been in scroll mode. Depending on the cursor's position and the number of times you press the arrow key, it is possible that you might scroll the fixed cursor off the viewport.

You can continue to pan or scroll in the desired direction until the viewport shows the data that displays at the A_{IR}V_U TN screen's boundaries (the data in the A_{IR}V_U TN screen's top line, bottom line, first column, or last column). For example, if you press the key sequence that pans the viewport to the right, the viewport pans to the right of the cursor position (while the cursor remains fixed in its position) until the data that would appear in the A_{IR}V_U TN screen's rightmost (eightieth) column appears as the viewport's last column as shown in the following illustration.



Likewise, the viewport pans the data to the left of the cursor's position until the data at the **AIRVU** TN screen's first column appears at the viewport's first column. The example viewport in the previous illustration shows the limits for scrolling in any direction.

Automatic local printing at the PTC

This feature is valid only for **AIRVU** TN 3278 emulations.

You can initiate a local print operation by editing the host application to include a write-type command followed by a write control character (WCC) before the 3270 data stream. The write-type command must be the first byte in the data stream. The WCC must be the second byte. The write-type command and the WCC are both determined by their position in the data stream. If you set the WCC's start-printer bit (bit 4) to 1, the local print of the display data is initiated.

A PTC running `AIRVU` TN 5250 emulation can be set up to use a local printer or the system printer. If the PTC is set to use the system printer, it sends the print aid code (0xF6) to the host application. When the host application receives the print aid code, it determines what to print and assigns a printer to print it.

If the PTC is set up to use a local printer, the PTC spawns a program called `ptces_lp.exe` when you press the Print key. If this program does not exist, an error message prints. If the program does exist, the PTCs keyboard is restored to a normal, MS-DOS keyboard and the displayable buffer is saved to a file called `ptces_lp.dat` before calling the print program. The print program can be written to interface with the printer attached to the PTC.



Solving problems 7

This chapter defines a troubleshooting philosophy for AirVu TN 3270/TN 5250 systems and lists the error codes that the PTC or PBC display in the event of system problems.

Troubleshooting overview

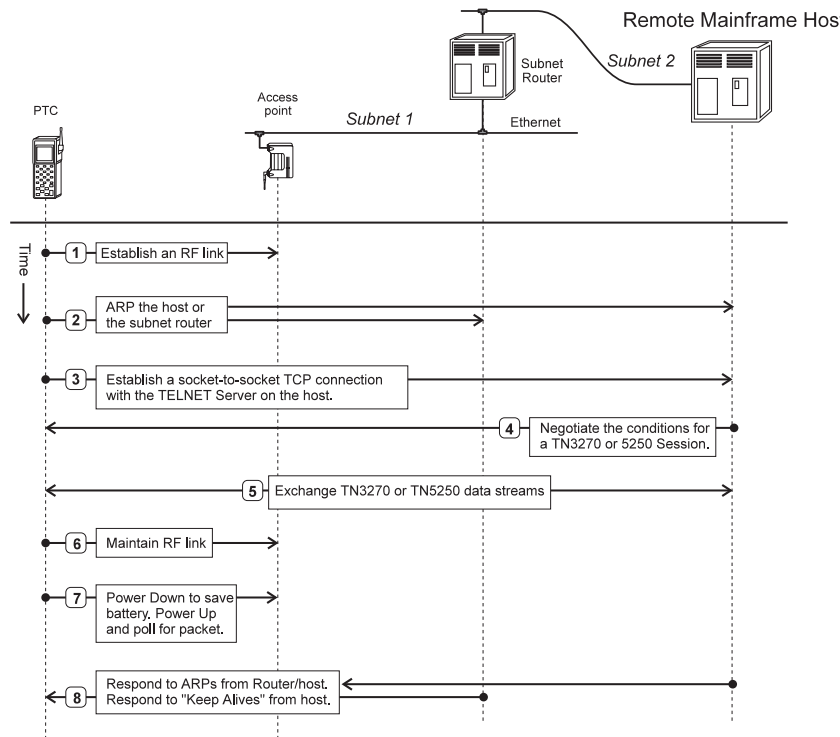
Troubleshooting an AirVu TN 3270 or AirVu TN 5250 system that fails to establish a session can begin by observing data traffic on the Ethernet LAN. You can observe such data using monitor tools such as AirMon. Ethernet line monitors are also invaluable tools that can test a faulty system and determine where it deviates from the normal communication sequence.

How an AirVu TN 3270/TN 5250 session is established

The data provided by monitors and Ethernet sniffers provide clues that you can use to get to the bottom of a problem and thereby reach a solution. But before beginning any troubleshooting, it is necessary to have an understanding of how a AirVu TN 3270 or AirVu TN 5250 session is established. The following paragraphs should provide you with such an understanding.

An AirVu TN 3270 or AirVu TN 5250 session is established by a sequence of packet exchanges between the AirVu TN client (usually a PTC, PBC, or PTC-870IM). The data in the packets flow from the PTC to the access point, then through the Ethernet LAN to the host. If there is a subnet router in the system, the packets flow through it as well.

The illustration below shows the steps involved to establish a A_{IR}V_U TN 3270 or A_{IR}V_U TN 5250 session between a PTC and a host with a subnet router in the system.



Step 1

The registration process that establishes the wireless link to an access point.

Step 2

An Address Resolution Protocol (ARP) request from the IP stack in the PTC to the host or subnet router. The ARP response returns the MAC address of the target device that allows the PTC to build an IP-MAC address binding in its ARP queue.

Step 3

The three-way handshake that establishes a TCP socket-to-socket connection between the PTC and the host TELNET server.

Step 4

The negotiation between the PTC and the server to establish a `AIRVU TN 3270` or `AIRVU TN 5250` session. Three items are negotiated:

- terminal type,
- transmission in binary mode, and
- the use of EOR to mark the end of a transmission stream.

Step 5

The exchange of a 3270 or 5250 data stream.

Step 6

An occasional and regular re-registration to maintain the link between the PTC and its access point.

Step 7

Suspends radio activity, including reception, in order to conserve the PTC's battery. The step also includes powering up and polling the AP for data.

Step 8

Responds to ARP requests that may be sent to a PTC when a host or router rebuilds its ARP queue or restores a binding. Step 8 can occur at any time and often depends on Steps 6 and 7.

AVU TN 3270/TN 5250 connection

Before the connection occurs, the PTC'S radio must be initialized. After initialization, the radio establishes its radio link to the access point. The access point then ARPs the host or subnet router, which allows the socket-to-socket TCP connection with the TELNET server on the host.

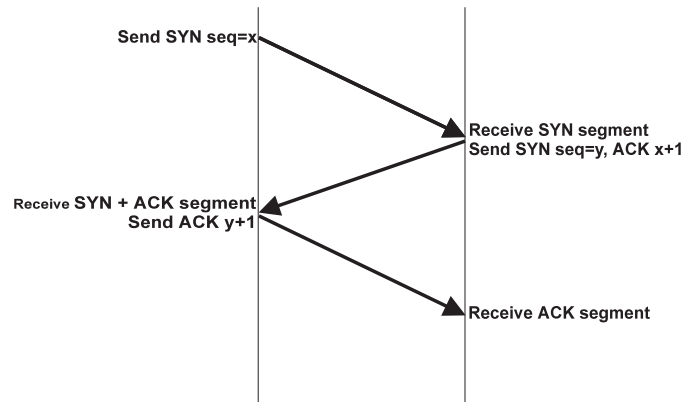
How a connection is made to the TELNET server

To make a connection to the TELNET server, the PTC tells the host that it wants to connect with the host's TELNET port. Once its radio is initialized, the connection process involves four basic steps.

1. The PTC sends a SYNchronization (SYN) packet to the host.
2. The host sends an ACKnowledgement (ACK) packet back to the PTC stating that it has received the SYN packet.
3. The host sends a SYN to the PTC.
4. The PTC returns an ACK.

At this point, both the PTC and the host have agreed that a connection has been made. Connections can be made from either end (PTC or host) or simultaneously.

The illustration on the **following page** shows how the connection is made.



How TELNET sessions are negotiated between a host and PTC

With IBM 3270/5250 terminal emulation through a TELNET session, both the TELNET process and the PTC must be able to communicate with each other in a particular way. The IBM TELNET operation needs to have three different modes of operation in order to function properly. These modes include:

- TermType,
- End Of Record, and
- Binary

The negotiation sequence

After the PTC registers, ARPs for the address of the host, and makes a connection, the negotiation process begins. The host requests the PTC to state its terminal type so it can determine how to set up the session.

When negotiations are made between the TELNET server and the PTC (or vice-versa), a 2-byte command

is sent telling the receiver that a negotiation is going to take place. The first byte of this 2-byte command is the Interpret As Command (IAC) byte. The IAC byte tells the receiver that a negotiation command is going to take place. The second byte is the negotiation session command (Do, Will, Don't, Won't). The table on the following page defines these negotiation session commands in the context of a TELNET session.

Hex code	Session command	Tasks performed
FD	Do (option)	Ask other to perform option.
FB	Will (option)	Other agrees. Option holds.
FD	Do (option)	Ask other to perform option.
FC	Won't (option)	Other refuses. Option not valid.
FB	Will (option)	Sender express desire to start option.
FD	Do (option)	Other gives permission. Option holds.
FB	Will (option)	Sender indicates desire to start option.
FE	Don't (option)	Other refuses. Option not valid.
FC	Won't (option)	Confirmation that option will not be in effect.

The last byte represents the option desired. The following table shows the relevant IBM terminal emulation options.

Hex code	Option	Function
18	Term Type	Describes the type of emulation process the PTC desires.
19	EOR	End of Record negotiation.
0	Binary	Transmit in binary mode.

General troubleshooting

Most problems with A_{IR}V_U TN 3270 or A_{IR}V_U TN 5250 failures display a 1300 error code on the PTC. Because this error code is so general, more investigation is necessary to find the cause of the problem. Before using a monitoring tool, investigate the following possible causes of the failure.

A bad network connection

Check the access point's physical connection to the network. Once you have verified that it is connected properly, TELNET to the access point and try to ping other nodes on the network. This should verify proper access point operation.

No power to the access point

Make sure the access point's power supply is plugged in and the access point is properly connected to the power supply. Then make sure the access point is turned on.

Incorrect RF system setup

Check the variable parameters: System ID, Channel (900 MHz systems), Bit Rate and Frequency (2.4 GHz systems). Make sure the RF parameters between the PTC and access point match exactly. For Bit Rate and Frequency, match the PTC's indexes to the actual parameters set in the access point (354, 500, 1000, and 2000 on the access point equates to 1, 2, 3, and 4 on the PTC).

Incorrect host or the host is down

Verify that all IP addresses are correct for the host, router, and so on.

Faulty or damaged radio

When all parameters are correctly set, and an RF connection still cannot be made, the access point or the PTC (or both) could have a faulty radio. Try replacing either the access point or PTC and try to establish the connection again.

Improper TELNET connection

If you accidentally connect to a UNIX TELNET port, the application will crash. The UNIX platform will start a session and try to communicate with the PTC. But the PTC cannot communicate with the host, so it freezes and displays no error code.

If no discrepancies described above are found, connect a monitoring tool to the system.

AIRMON

This utility was created by Telxon to view all RF packets from a laptop or PC running Windows. AIRMON can be very effective when attempting to determine if network problems reside in the RF packet flow.

All PTCs use a registration process to register to an access point, which involves the PTC sending a broadcast packet to the radio network called a FIND ROUTER packet. This packet is 1500 bytes long and is used to tell any access points on the network that the PTC desires to register. The packet is 1500 bytes long so that access points on the fringe of the radio coverage are less likely to respond and the potential exists that the packet will not be received.

If the radio parameters are set correctly and the access point is powered on, you should see a new packet (ROUTER ID), which AIRMON displays. The ROUTER ID packet is one that is sent from one access point to others that are within range of the FIND ROUTER packet. Using algorithms, the PTC decides which access point it wishes to register to, and sends a REGISTRATION REQUEST packet to that access point. If the packet is received by the access point, it sends a REGISTRATION ACKNOWLEDGMENT packet to the PTC indicating that the PTC's request was accepted.

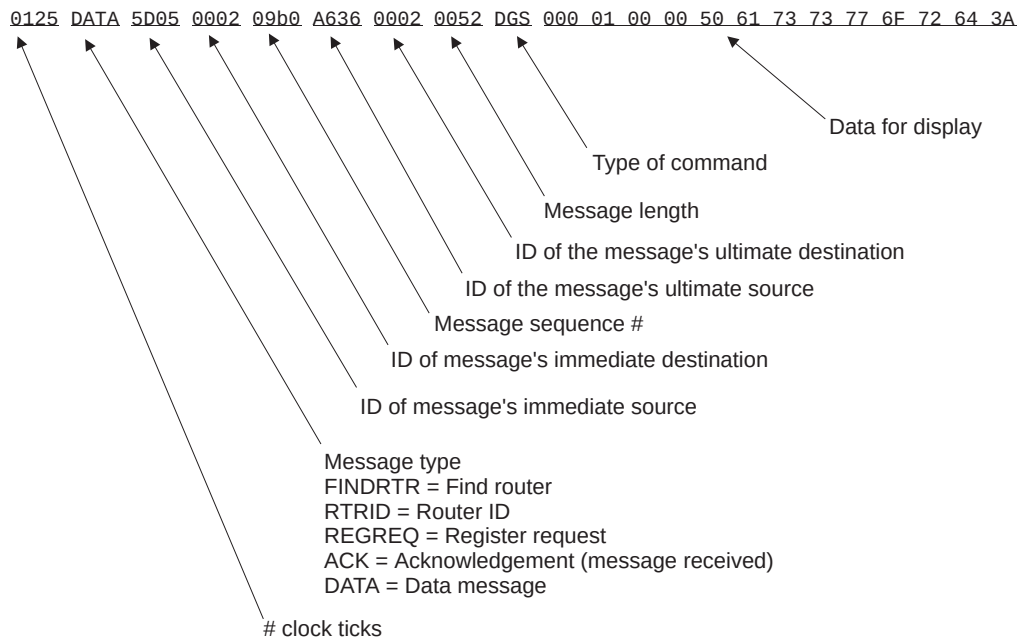
AIRMON displays these packets as they are sent and received over the radio network. If AIRMON shows a registration has taken place, you can assume that the radio parameters have been set correctly.

Even if registrations have taken place, you can use AIRMON to check the reliability of the radio network. Check for a large number of packets being resent for any reason. All RF networks will have retries but when they become excessive, this is usually an indication of a problem.

When a PTC gets close to the RF network's fringe areas, retries become more frequent until a threshold of retries occurs. When this happens, the PTC tries to register to another access point that it is closer to. Normally, re-registering to a closer access point will reduce the number of retries to an acceptable amount. But if the PTC re-registers, and retries are still high,

the unit's radio may be out of calibration or beginning to fail. Have the radio serviced.

The following illustration shows a typical **AIRMON** line and explains its contents.



Error codes

Errors starting and during a session

When you begin an AIRVU TN 3270 or TN 5250 emulation session, you may see several error messages. The following table lists the most commonly generated PTC system errors. The error codes in this table have the format:

Xh

where X is the transmission control protocol (TCP) error.

Error code format

PTC error codes have a standard format as follows:

Error: __ xx

Line 1

Line 2

The table below shows how the error codes are defined.

Error # (denoted as xx)	Line 1	Line2
07	Invalid host	Address
09	Network	Unreachable
10	Host	Unreachable
13	Network	Timeout
14	Cannot resolve	Hostname
19	TCP EOF	Received
20	TCP connection	Reset

TCP/IP error and suberror codes

The following table lists system call error codes by name in alphabetical order, and include suberrors under the error with which they are associated.

Error number and name	Error meaning
2 NET_DOS_ERR	DOS error. DOS was unable to perform a function requested by the PC/TCP kernel. This may occur during name resolution if the host table file can't be read. Otherwise, it indicates that the DOS FILES setting in CONFIG.SYS needs to be higher to provide the kernel the resources to open a new network connection.
41 NET_ERR_ARP_ENTRY_NOT_FOUND	No such ARP or IP address exists.
18 NET_ERR_BADARG	Program error. Invalid argument to a system call. An illegal or out-of-range value was passed to the call that failed.
32 NET_ERR_BADCONFIG	Program error; kernel cannot run yet.
17 NET_ERR_BADFORMAT	Program error; bad format for numeric IP address or a field in an IP address structure that must be non-zero is zero.
31 NET_ERR_BAD_INTERFACE	Program error; the interface specified does not exist.
6 NET_ERR_BADPKT	Program error; illegal packet passed to PC/TCP. This error is not generated by version 2.05 or later kernels.
24 NET_ERR_BADSYSCALL	Program error; invalid or unsupported system call passed a bad value to the kernel. This may indicate that the version of the kernel in use does not support the function called.

Error number and name		Error meaning
25	NET_ERR_CANTBROADCAST	Program error; the flag NET_FLG_BROADCAST was specified where it was not allowed.
8	NET_ERROR_CANTOPEN	DOS error; cannot open a DOS file. The host file table cannot be opened and either no Domain Name Servers are configured or the kernel was specifically asked to use the host table.
34	NET_ERROR_CANT_SHUTDOWN	Program error; cannot unload kernel from a multitasking environment.
39	NET_ERR_DOSEXT	DOS-extender error
19	NET_ERR_EOF	Network error; on a TCP connection, the foreign host indicated an "end of file" by sending a TCP FIN.
33	NET_ERR_EMM	DOS or program error; error involved an expanded memory manager, or an improperly configured system.
14	NET_ERR_HOSTUNKNOWN	Program error; the hostname cannot be resolved. The host name specified is not in the host table and is not known to any configured Domain Name Servers.
10	NET_ERR_HOST_UNREACHABLE	Network error; the host is unreachable. The specific reason is provided by one of the following suberror codes.
	2 NET_SUB_ARP	Direct ARP failed; the PC/TCP kernel did not receive a reply to its broadcast. This means that either the host is unknown or your Ethernet or Token Ring LAN has a hardware problem
	6 NET_SUB_GW	First hop gateway down. The destination host is not on the local subnet, and the default routers are down (not responding to the ARP).

Error number and name	Error meaning
1 NET_SUB_ICMP_UNR	ICMP destination unreachable; an IP router returned an ICMP Destination Unreachable error with a code of "host unreachable." Normally, this means that the host's home network can be reached, but the host is down.
3 NET_SUB_IF_FAILURE	Hardware error; the hardware interface returned an error when the kernel attempted to transmit. The interface may be defective, misconfigured, or not connected to the LAN.
4 NET_SUB_IF_UNR	Hardware link failure; the hardware interface reported a media problem.
5 NET_SUB_NOROUTE	No route to the destination was specified. No default IP routers are configured, and the IP address you are trying to reach is not on the local subnet. This error may also be caused by a misconfigured IP address or subnet mask.
28 NET_ERR_ICMPMSG	Program or network error; an IP datagram the kernel sent was returned with an ICMP error. The specific reason is provided by one of the following suberror codes:
13 NET_SUB_ADMIN_PROHIB	Communication prohibited; communication with the destination host has been prohibited by the administrators of either the specified host or of the network on the path.
8 NET_SUB_CANTFRAG	Cannot fragment the packet; the datagram was too big to transmit on a network between the local host and the destination host.

Error number and name	Error meaning
7 NET_SUB_ICMP_UNREC	Unknown ICMP message; the kernel does not recognize the ICMP error type returned.
12 NET_SUB_PARAM	ICMP parameter problem message; an IP option in the datagram could not be processed by a router or the destination host. Normally, only seen when IP security is in use, and the security level in the PC is configured for is not what the server expects.
10 NET_SUB_SORCEQ	ICMP Source Quench message; An IP router in the path is overloaded, and is requesting a slower transmission rate.
9 NET_SUB_SRCR_FAIL	An IP Loose or Strict source route couldn't be satisfied by an IP router in the path.
11 NET_SUB_TIMEX	ICMP Time Exceeded message; the IP Time to Live field in a datagram reached zero before it reached the final destination.
5 NET_ERR_ILLEGALOP	Program error; illegal operation on this kind of descriptor. The requested operation cannot be performed on this network descriptor.
1 NET_ERR_INUSE	Program error; the requested protocol or socket is already in use. The application attempted to open a TCP or UDP connection with a combination of IP address, local port, and foreign port that conflicted with a connection already in use by another application.

Error number and name		Error meaning
9	NET_ERR_NET_UNREACHABLE	Network error; the network is unreachable. An IP router was asked to forward a packet, but could not and returned an ICMP error. This may indicate either that the destination address is nonexistent, or that a network link is down between the local and destination hosts.
40	NET_ERR_NO_ARP	Network error; kernel does not support ARP.
23	NET_ERR_NODESC	Program error; could not allocate a network descriptor or the PC/TCP kernel is out of network descriptors. This may indicate that another application is not closing descriptors correctly when it is through.
7	NET_ERR_NOHOST	Program error; no host bound to this connection. The struct addr passed did not contain an IP address where one was required.
3	NET_ERR_NOMEM	Program error; returns an error for the following conditions: PC/TCP is out of memory. An application calls a PCTPAPI.DLL routine when the VPCTCP.386 VxD has run out of Protected Mode to V86 copy buffers. The caller has not provided PC/TCP with enough memory to process the caller's request.
36	NET_ERR_NOQIOS	Program error; no kernel queued I/O control blocks available at this time.
15	NET_ERR_NOSERVERS	Program error; no name servers are configured. The application requested a Domain Name Service, but no servers are configured.

Error number and name		Error meaning
26	NET_ERR_NOTESTAB	Program error; operation is illegal. The connection is not in established state. The TCP connection is not open. This may occur after a nonblocking net connect, before the connection's initial handshaking has completed.
4	NET_ERR_NOTNETCONN	Program error; <i>nd</i> is not a network descriptor. The network descriptor value passed was bad or not presently open.
35	NET_ERR_PARKED_IN	DOS error; cannot unhook an interrupt from inside chain.
12	NET_ERR_PORT_UNREACHABLE	Program or network error; port is unreachable. The host specified does not have a server for this UDP-based protocol. If this error is returned by an RPC library routine, it may indicate the host has a defective or misconfigured Portmapper server.
11	NET_ERR_PROT_UNREACHABLE	Program or network error; protocol is not active in the remote host. The host does not have a server for this IP protocol.
27	NET_ERR_REENTRY	Program error; the kernel has been re-entered from an interrupt service routine or as a result of a multitasking scheduler.
20	NET_ERR_RESET	Network error; a TCP connection was aborted, either because the foreign host sent a TCP RST indication, or because the PC/TCP kernel was asked to transmit some data, but never received an acknowledgment from the foreign host.
16	NET_ERR_SERVER_ERR	Network error; a bad reply from the name server. The Domain Name Server replied, but did not answer the query.

Error number and name		Error meaning
30	NET_ERR_TAG_LOCKED	Program error; Cannot set this tag in a running kernel. After initialization, the kernel has locked this variable and does not allow it to be changed.
29	NET_ERR_TERMINATING	Program error; the kernel is unloading.
13	NET_ERR_TIMEOUT	Network error; the operation pending on this descriptor timed out. The operation failed because the other end of the connection did not reply. This may occur during name lookups if the Domain Name Server, or the path to the server, is down. If it occurs while connected to a host via a Telnet or FTP, the host may have crashed or the path to it may have failed.
22	NET_ERR_UNBOUND	Program error; a network descriptor does not have sufficient attributes to perform the requested network operation, or an operation was attempted on a network which had not yet been connected.
21	NET_ERR_WOULD_BLOCK	Program error; a receive call that would block was done on a nonblocking connection.
37	NET_ERR_WOULD_TRUNCATE	Program error; the datagram is too large and would be truncated.
0	NET_NOERR	No error; the pneterror routine has been called, but the last system call succeeded.

Contacting Telxon's Customer Support Center

If you are experiencing any problems that you cannot solve, contact Telxon's Customer Support Center for assistance at 1-800-800-8010.

The Customer Support Center is open from 8:00 a.m. to 8:00 p.m. (EST) Monday through Friday.

Contacting Telxon's bulletin board

Telxon maintains a bulletin board that is available to all customers who have signed a service agreement. The bulletin board contains product update announcements, reported problems, and updated software for downloading.

Contact the bulletin board at (330)-668-2994. If you have access to the bulletin board, you should check to see if a solution to your problem is available before you contact the Customer Service Center.



Glossary

Access point	The entry point to the LAN for a PTC/PBC/PTC-870IM. Commonly referred to as an AP.
AirMon	A Windows-based application that monitors Telxon radio frequency packets.
ARC image	A binary image of an EEPROM drive. ARC images usually contain all of the files necessary to implement a dedicated application. For example, an ARC image for terminal emulation would include the radio packet driver, the driver for the IP stack, the configuration files, the terminal emulation program, CONFIG.SYS, and AUTOEXEC.BAT files.
ARP	Address Resolution Protocol. The TCP/IP protocol used to dynamically bind a high-level IP address to a low-level hardware address. ARP is used across a single physical network and is limited to networks that support hardware broadcast.
AS/400	An IBM mid-range minicomputer.
Client	A node on the network that sends a request to a server and waits for a response. PTCs are referred to as clients in a AirVU TN 3270 or AirVU TN 5250 system.
IP Address	A 32-bit address assigned to each host that participates in a TCP/IP Internet. IP addresses are the abstraction of physical hardware addresses just as an Internet is an abstract of physical networks. To make routing efficient, each IP address is divided into a network portion and a host portion.

IBM 3270	The function of the operating system 3270 device emulation support that converts 3270 data streams intended for a 3278 display station into data streams that can be recognized by a display station attached to the host system.
IBM 5250	5250 Information display system. A cluster of work stations directly attached to a host systems by means of an IBM 3179-2 control unit as it pertains to Telxon's implementation.
LANWatch	A DOS-based application that monitors frames on Ethernet or Token Ring LANs.
PTC	Portable Teletransaction Computer
PBC	Portable Pen-Based Computer
Radio parameters	Configuration parameters that determine the characteristics of direct sequence spread spectrum radio.
Server	Any program that offers service that can be reached over a network. A server accepts requests over the network, acts on the request, and returns the results to the requester.
SNA	Simple Network Architecture. The name applied to an architecture and a class of network products offered by IBM Corporation. SNA does not interoperate with TCP/IP.

TCP	Transmission Control Protocol. The TCP/IP standard transport level protocol provides reliable, full duplex, stream service on which many application protocols depend. TCP allows a process on one machine to send a stream of data to another for processing. TCP is connection oriented in the sense that before transmitting data, participants must establish a connection. All data travels in TCP segments, which each travel across the Internet in an IP datagram. The entire protocol suite is often referred to as TCP/IP because TCP and IP are the two fundamental protocols.
TCP/IP	Transmission Control Protocol/Internet Protocol. A set of communication protocols that support peer-to-peer connectivity functions for both local and wide-area networks.
Terminal emulation	The capability of a microcomputer to operate as if it were a particular type of terminal linked to a processing unit from which it can access data.
WLAN	Telxon's Dataspan Wireless Local Area Network.



Appendix A

PTC keyboards for AirVu TN 3270 and AirVu TN 5250

The figures on the [following pages](#) show the keyboards for the PTC models that function with AirVu TN 3278/5250 emulation for the following PTCs:

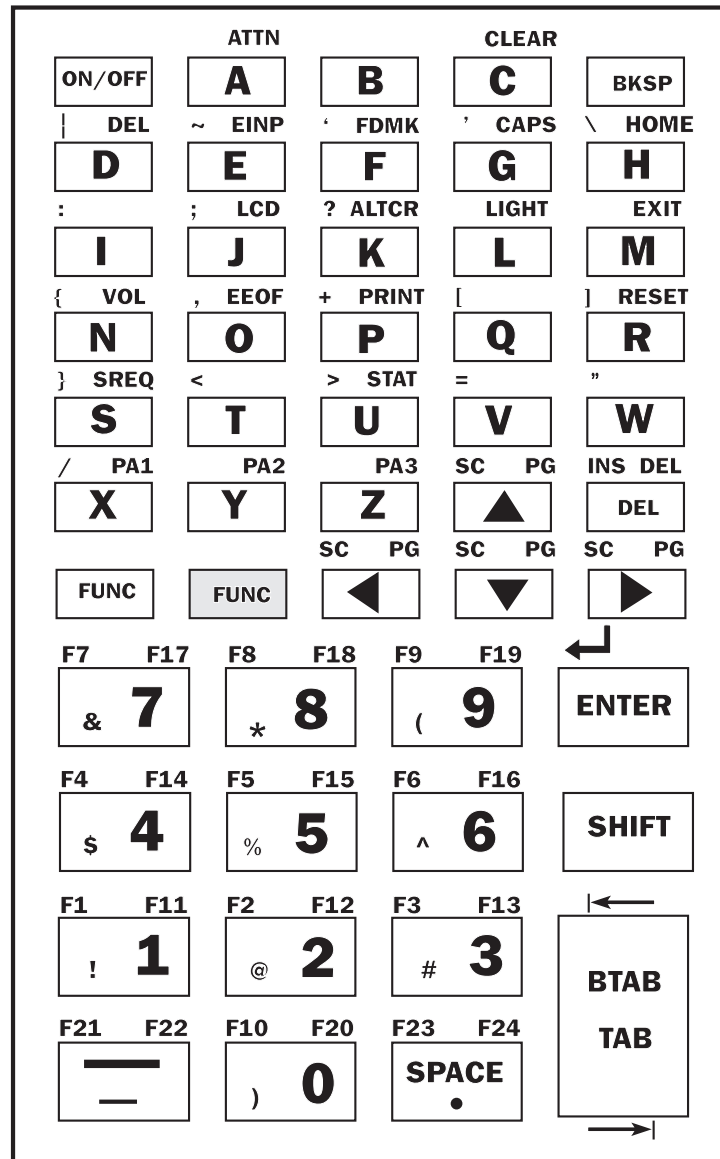
PTC-860	PTC-860IM	PTC-870IM
PTC-912	PTC-960	PTC-960RL
PTC-960SL	PTC-113X, 114X, 118X	

DOS equivalent keys

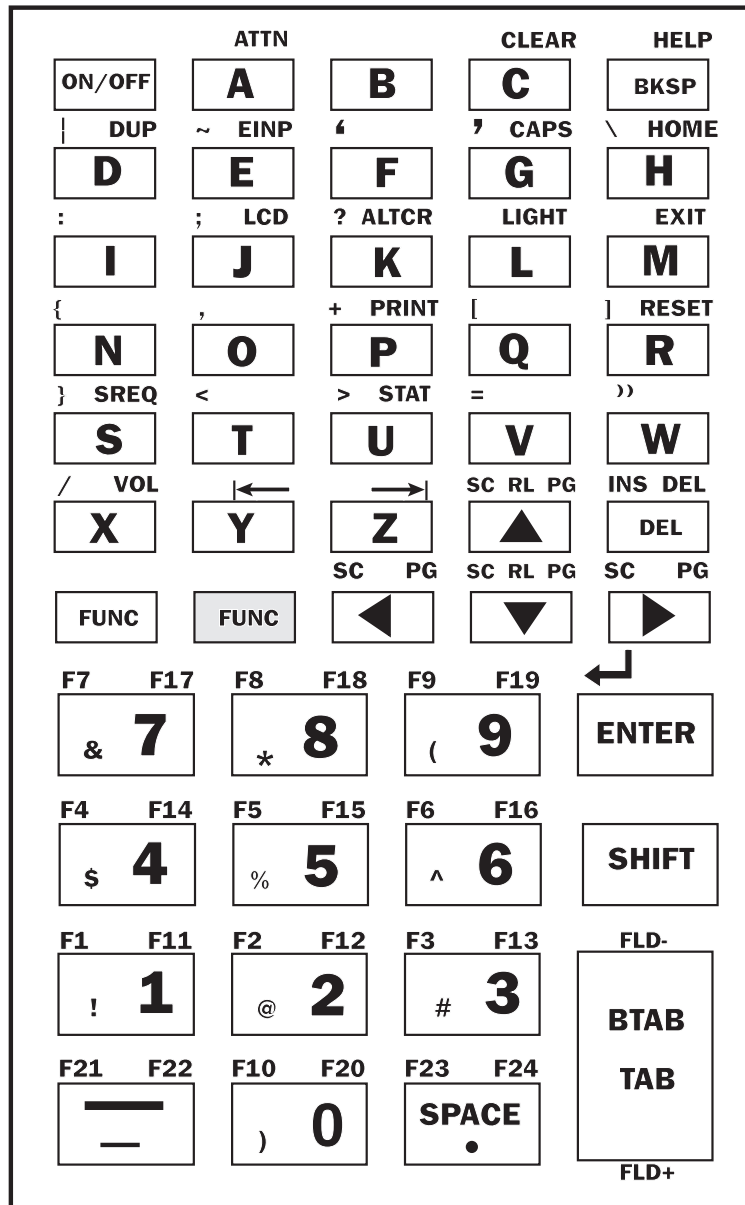
If the PTC is 3-keyed, the keyboard is mapped to a DOS keyboard. Once at the DOS prompt, pressing Ctrl Alt Delete reboots the unit and invokes the emulation program. The table on the [following page](#) shows DOS keys and their equivalent keys on the emulation keyboard.

DOS Keys	PTC-860	PTC-960	PTC-860IM	PTC-870IM	PTC-912
ALT	GREEN FUNC	GREEN FUNC	PAGE UP	YELLOW FLD+ (TAB) FUNC	
CTRL	DASH	DASH	GREEN FUNC	GREEN FUNC	GREEN FUNC
DEL	ENTER GREEN FUNC	DEL	PAGE DOWN	DELETE	SHIFT FLD+ (TAB)
. (period)	ENTER W	ENTER W	PAGE LEFT W		YELLOW FUNC R
: (colon)	ENTER N	ENTER N	PAGE LEFT N		YELLOW FUNC G
_ (underscore)	ENTER F	ENTER F	PAGE LEFT F		YELLOW FUNC O
\ (backslash)	ENTER C	ENTER C	PAGE LEFT C		YELLOW FUNC A
* (star)	YELL, FUNC 8	YELL, FUNC 8	DASH 8		X 8
(or, pipe)	ENTER D	ENTER D	PAGE LEFT D		YELLOW FUNCB

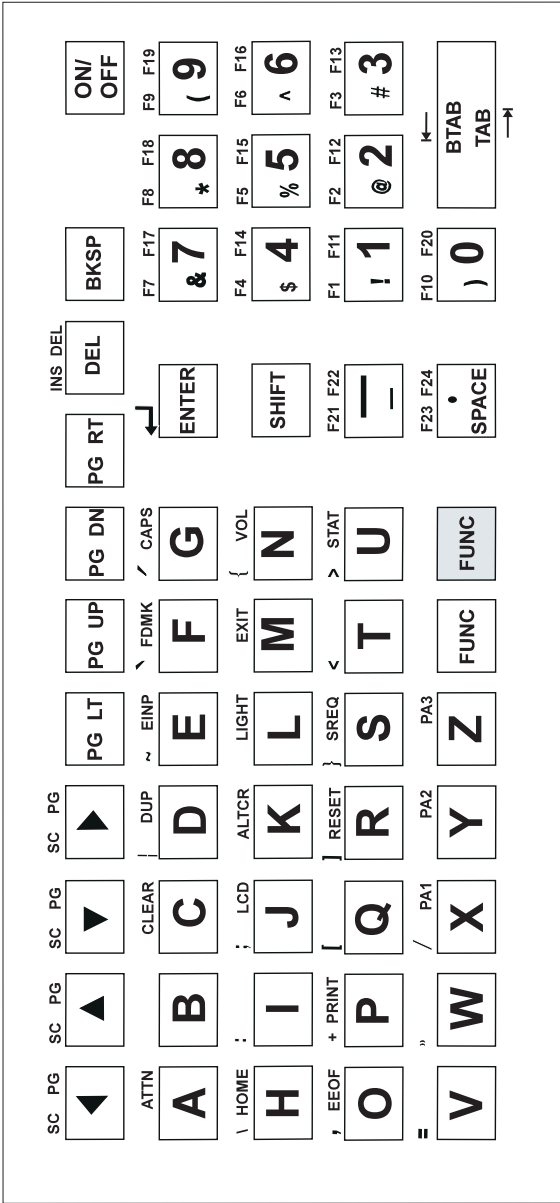
AirVu TN 3270 PTC-860 keyboard



AirVu TN 5250 PTC-860 keyboard



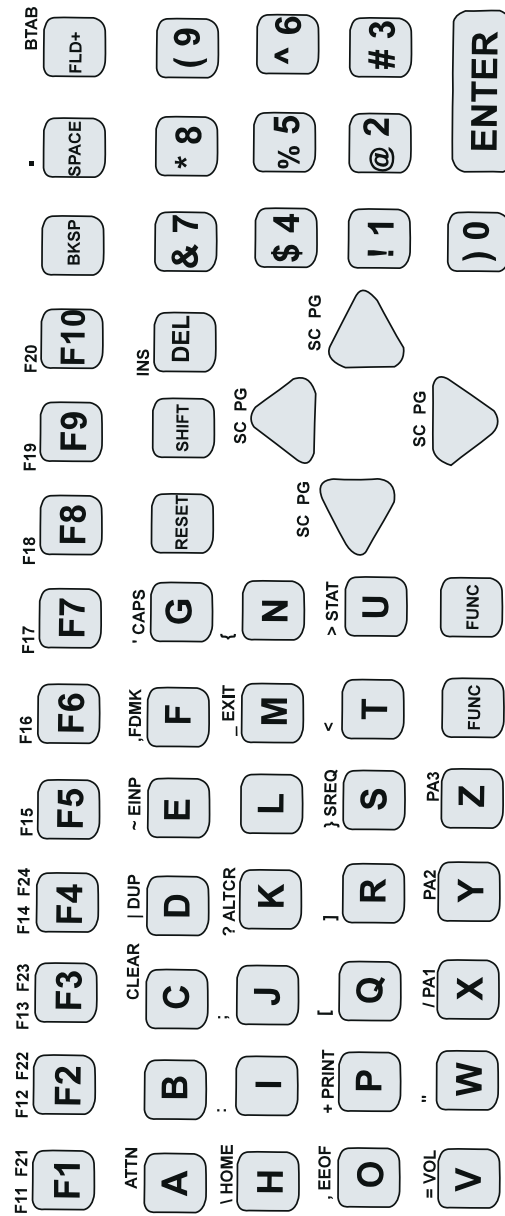
AIRVU TN 3270 PTC-860IM keyboard



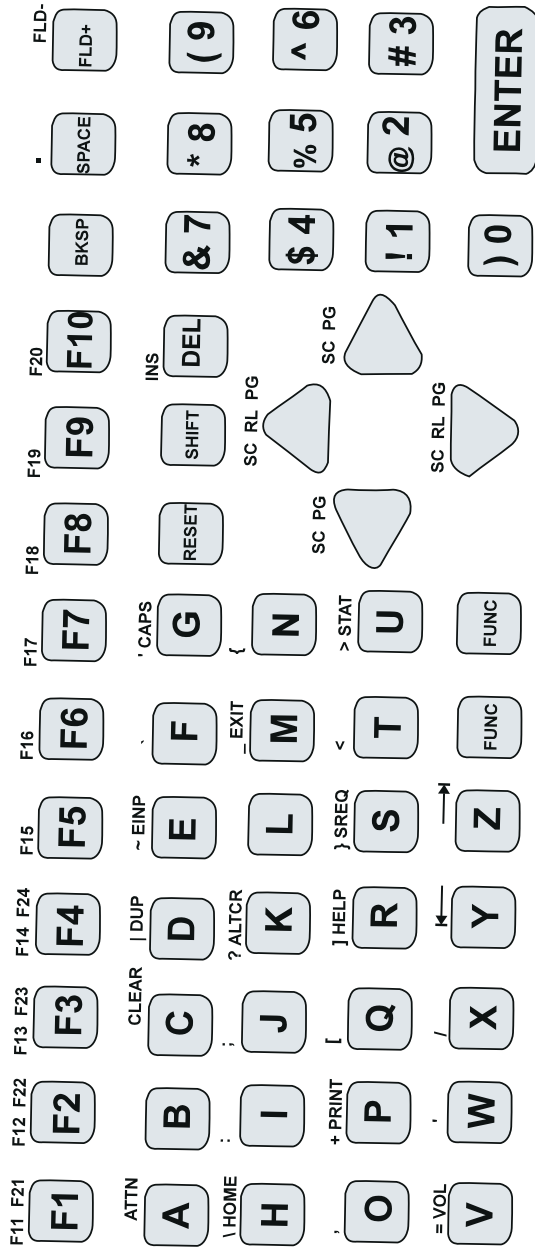
AirVu TN 5250 PTC-860IM keyboard

SC PG	SC RL PG	SC RL PG	SC PG	PG LT	PG UP	PG DN	PG RT	INS DEL	HELP	ON/OFF
ATTN	CLEAR	DUP	~ EIMP	EXIT	✓ CAPS	ENTER	↓	DEL	BKSP	F9 F19
A	B	C	D	E	F	G	ENTER	ENTER	& 7	F8 F18
\ HOME	:	;	? ALTCR	LIGHT	M	N	SHIFT	SHIFT	\$ 4	F5 F15
H	I	J	K	L	M	N	SHIFT	SHIFT	% 5	F6 F16
,	+ PRINT	[	] RESET	SREQ	T	U	—	—	! 1	F2 F12
=	/ VOL	←	→	Z	FUNC	FUNC	· SPACE	· SPACE	@ 2	F3 F13
V	W	X	Y	Z	FUNC	FUNC	· SPACE	· SPACE	FDL- BTAB TAB	F10 F20
										FLD+ FLD+

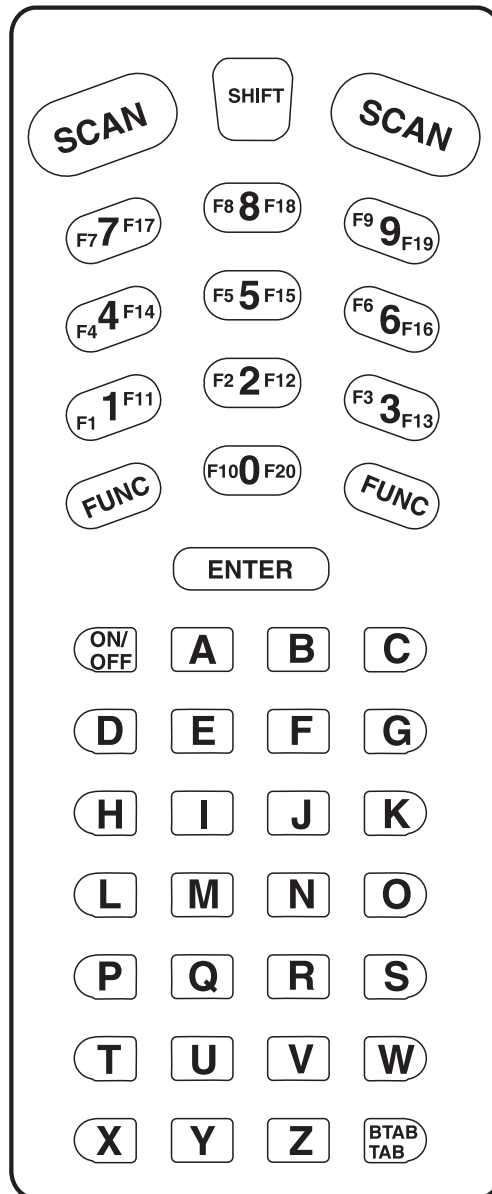
AIRVU TN 3270 PTC-870IM keyboard



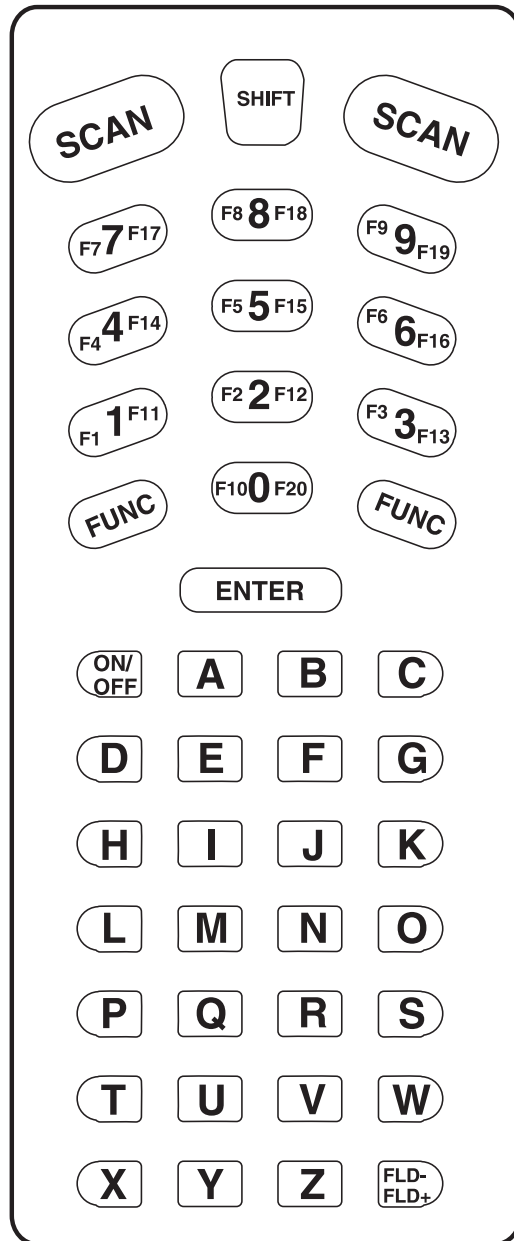
AIRVU TN 5250 PTC-870IM keyboard



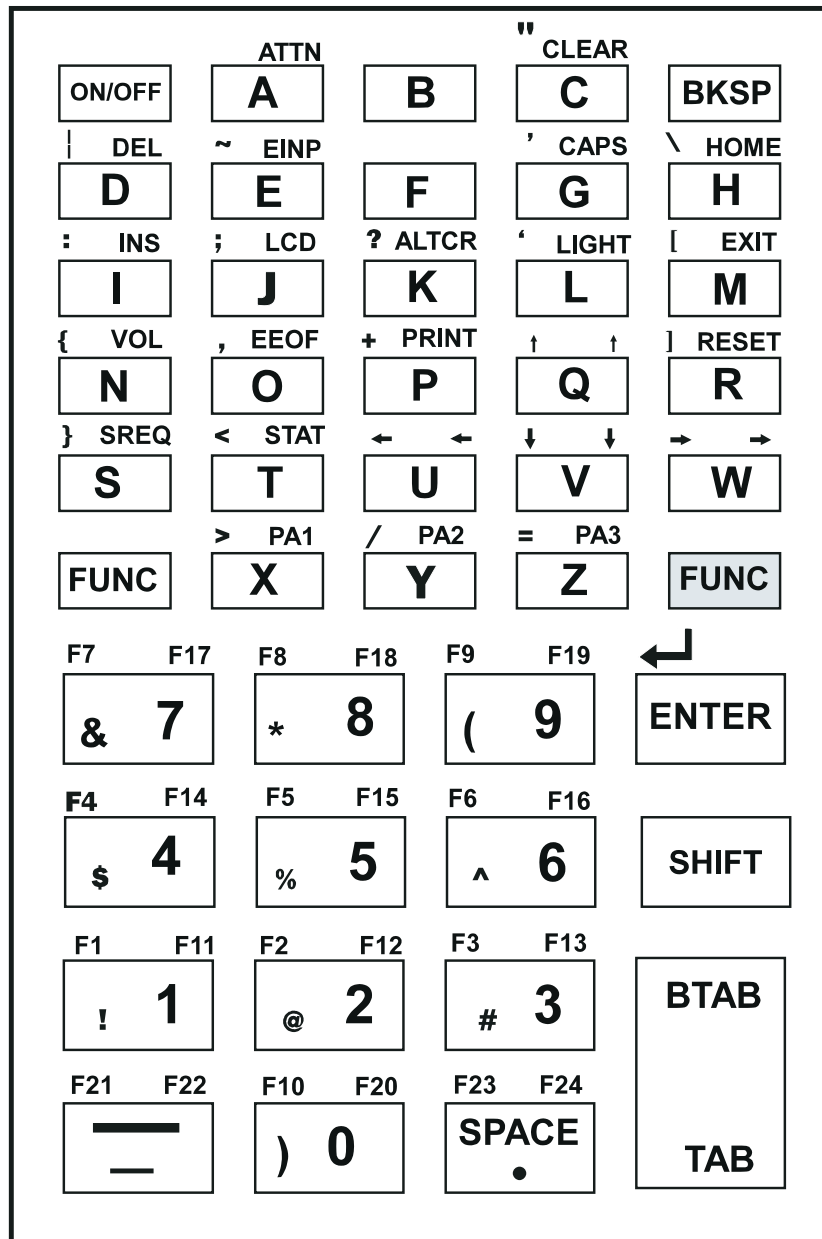
AirVu TN 3270 PTC-912 keyboard



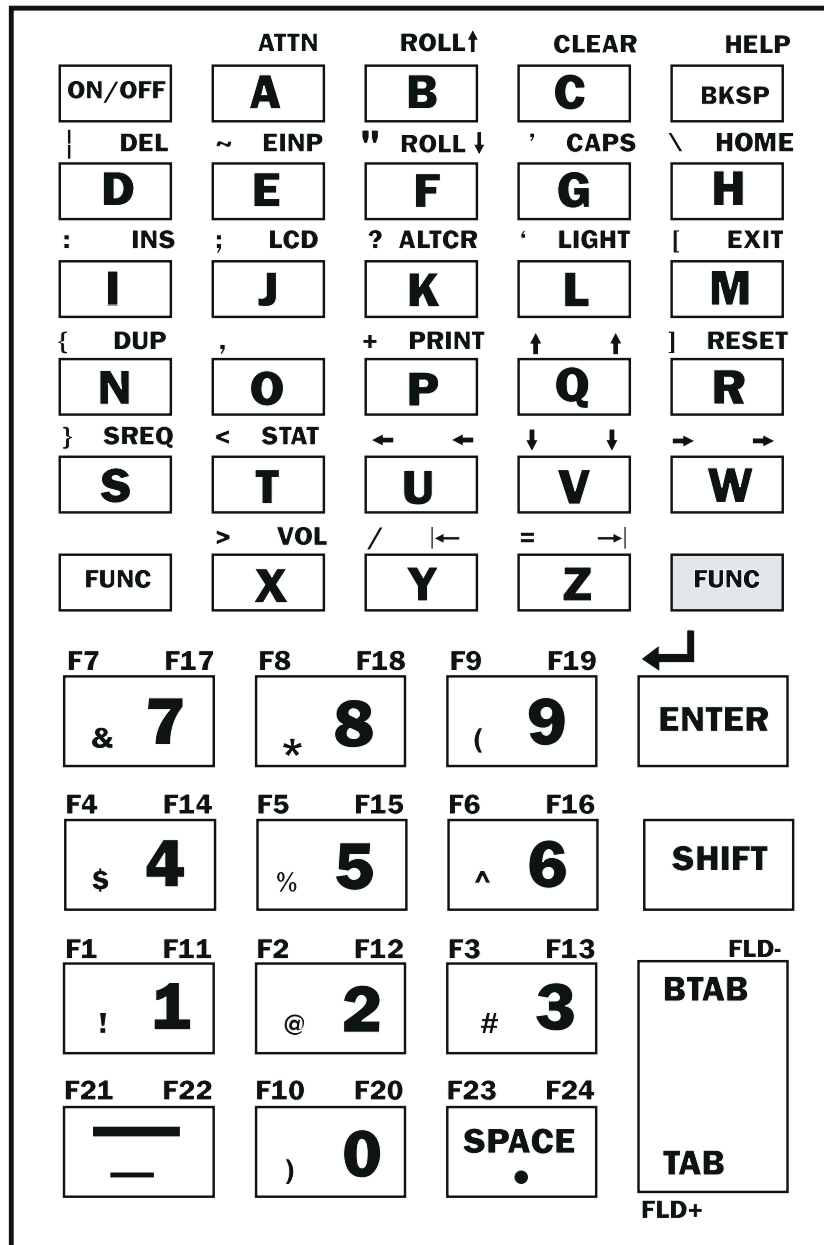
AirVu TN 5250 PTC-912 keyboard



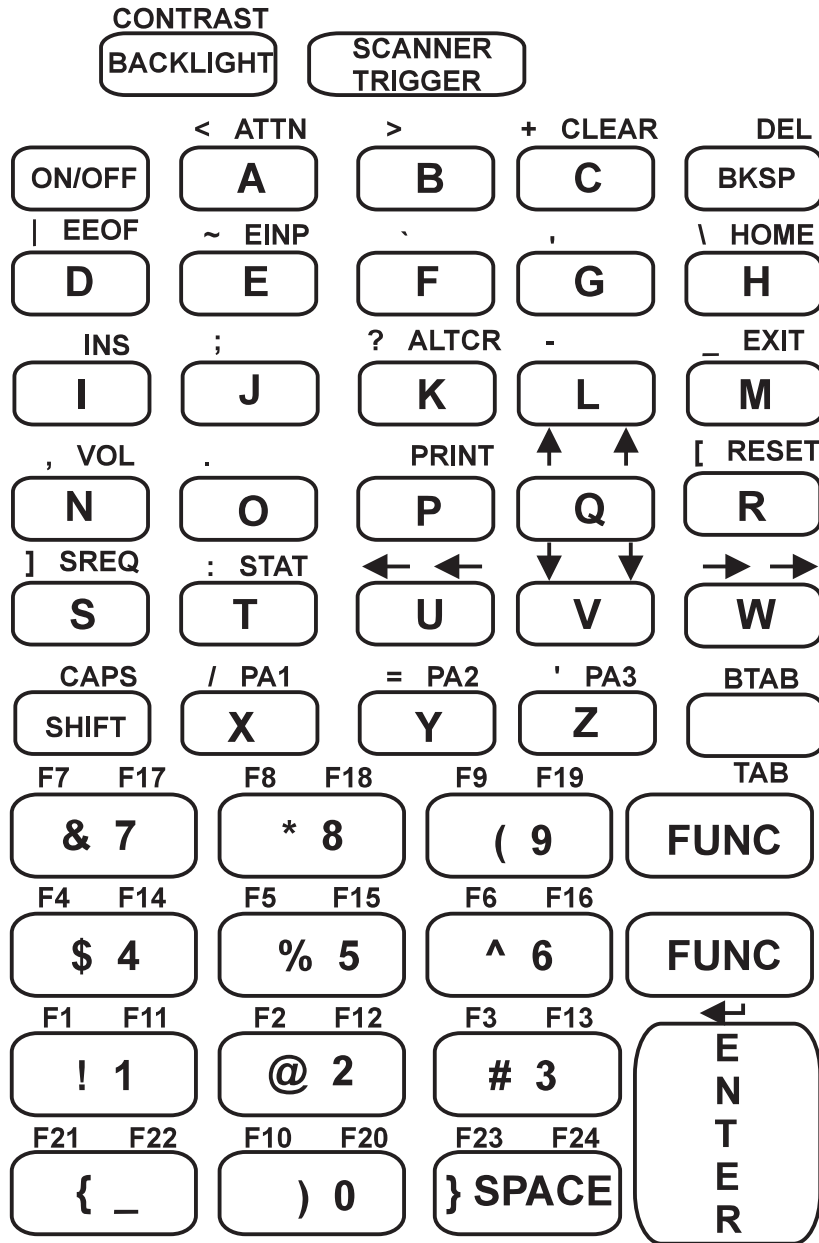
AirVu TN 3270 PTC-960/SL keyboard



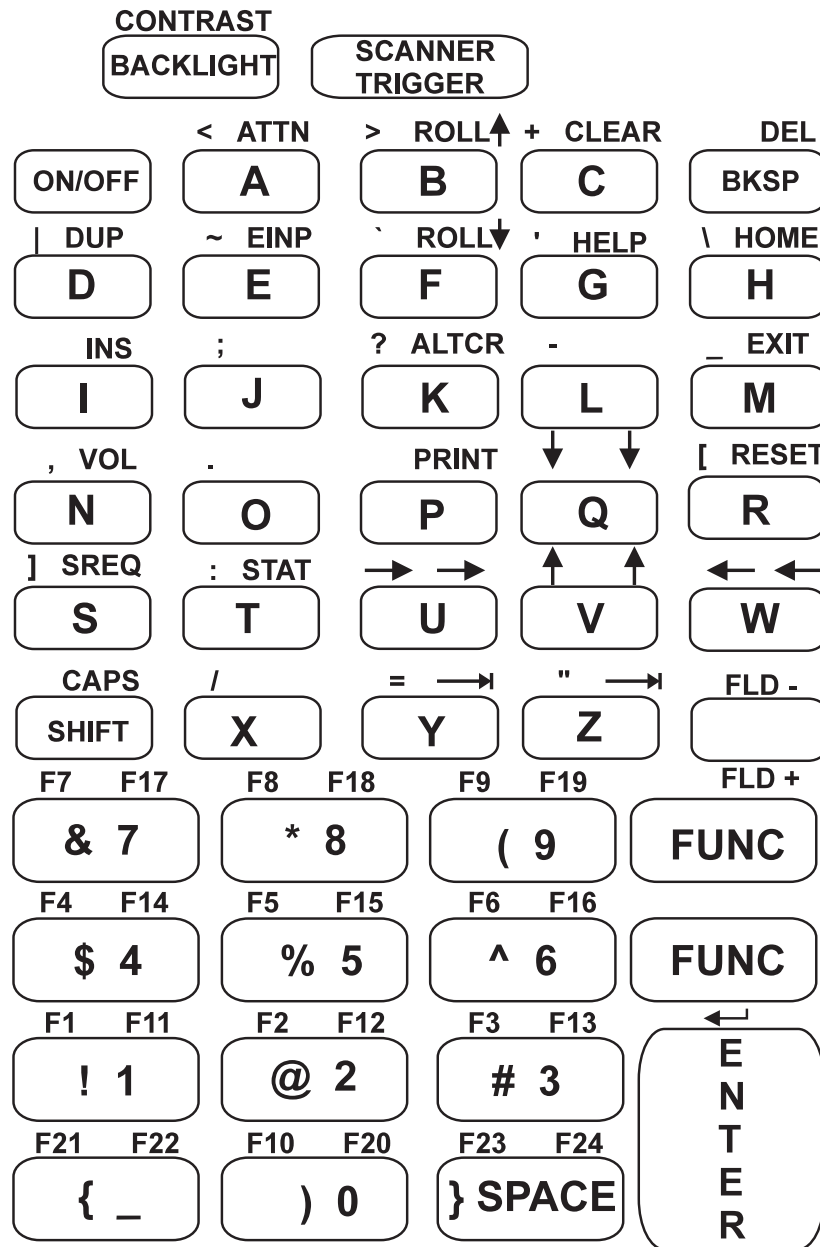
AirVu TN 5250 PTC-960/SL keyboard



AirVu TN 3270 PTC-960RL keyboard



AirVu TN 5250 PTC-960RL keyboard



TN 3270 alphanumeric keyboard for PTC-113X, 114X, and 118X

ATTN	CLEAR	<table><tr><td>PF1</td><td>PF2</td><td>PF3</td><td>PF4</td><td>PF5</td><td>PF6</td><td>PF7</td><td>PF8</td><td>PF9</td><td>PF10</td><td>PF11</td><td>PF12</td></tr></table>												PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12		
PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12																
EEOF	ERINP	<table><tr><td>'</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td><td>-</td><td>=</td><td>BKSP</td></tr></table>												'	1	2	3	4	5	6	7	8	9	0	-	=	BKSP
'	1	2	3	4	5	6	7	8	9	0	-	=	BKSP														
PA1	PA2	<table><tr><td>Tab</td><td>q</td><td>w</td><td>e</td><td>r</td><td>t</td><td>y</td><td>u</td><td>i</td><td>o</td><td>p</td><td>\</td><td></td><td>NLine</td></tr></table>												Tab	q	w	e	r	t	y	u	i	o	p	\		NLine
Tab	q	w	e	r	t	y	u	i	o	p	\		NLine														
PA3	HOME	<table><tr><td>Lock</td><td>a</td><td>s</td><td>d</td><td>f</td><td>g</td><td>h</td><td>j</td><td>k</td><td>l</td><td>;</td><td>,</td><td>{</td><td></td></tr></table>												Lock	a	s	d	f	g	h	j	k	l	;	,	{	
Lock	a	s	d	f	g	h	j	k	l	;	,	{															
Up	Dn	<table><tr><td>Shift</td><td><</td><td>z</td><td>x</td><td>c</td><td>v</td><td>b</td><td>n</td><td>m</td><td>,</td><td>.</td><td>/</td><td></td><td>Shift</td></tr></table>												Shift	<	z	x	c	v	b	n	m	,	.	/		Shift
Shift	<	z	x	c	v	b	n	m	,	.	/		Shift														
Lt	Rt	<table><tr><td colspan="3">RESET</td><td>INS</td><td>ALT</td><td colspan="6">Space</td><td>ALT</td><td>DEL</td><td>ENTER</td></tr></table>												RESET			INS	ALT	Space						ALT	DEL	ENTER
RESET			INS	ALT	Space						ALT	DEL	ENTER														

TN 3270 shifted keyboard for PTC-113X, 114X and 118X

SREQ	CLEAR	PF13PF14PF15PF16PF17PF18PF19PF20PF21PF22PF23PF24											
EEOF	ERINP	~!@#\$%^&*()=+BKSP											
QUIT	ALTCU	BTabQWERTYUIOP NLine											
EXSEL	PRINT	UnlockASDFGHJKL: " }											
Up	Dn	Shift>ZXCVBNM, . ? Shift											
Lt	Rt	RESETINSALTSPACEALTDELENTER											

TN 3270 Numeric keyboard for PTC-113X, 114X, and 118X

EEOF	EINP	1	2	3	4	5	6	7	8	9	0	BKSP	NLine
Tab	BTab	RESET	Ins	Space								Del	Enter

TN 5250 alphanumeric keyboard for PTC-113X, 114X, and 118X

ATTN	CLEAR	CM1CM2CM3CM4CM5CM6CM7CM8CM9CM10CM11CM12													
FLD+	FLD-	‘1234567890- =BKSP													
DUP	ERINP	Tabqwe rt yuiop \NLine													
HELP	HOME	Locka s d f g h j k l ; ' {													
Up	Dn	Shift< z x c v b n m , . /Shift													
Lt	Rt	RESETINSALTSpaceALTDELENTER													

TN 5250 shifted keyboard for PTC-113X, 114X, and 118X

SREQ	CLEAR	<table><tr><td>CM13</td><td>CM14</td><td>CM15</td><td>CM16</td><td>CM17</td><td>CM18</td><td>CM19</td><td>CM20</td><td>CM21</td><td>CM22</td><td>CM23</td><td>CM24</td></tr></table>												CM13	CM14	CM15	CM16	CM17	CM18	CM19	CM20	CM21	CM22	CM23	CM24		
CM13	CM14	CM15	CM16	CM17	CM18	CM19	CM20	CM21	CM22	CM23	CM24																
FLD+	FLD-	<table><tr><td>~</td><td>!</td><td>@</td><td>#</td><td>\$</td><td>%</td><td>^</td><td>&</td><td>*</td><td>(</td><td>)</td><td>=</td><td>+</td><td>BKSP</td></tr></table>												~	!	@	#	\$	%	^	&	*	(	)	=	+	BKSP
~	!	@	#	\$	%	^	&	*	(	)	=	+	BKSP														
QUIT	ALTCU	<table><tr><td>BTab</td><td>Q</td><td>W</td><td>E</td><td>R</td><td>T</td><td>Y</td><td>U</td><td>I</td><td>O</td><td>P</td><td> </td><td>NLine</td></tr></table>												BTab	Q	W	E	R	T	Y	U	I	O	P		NLine	
BTab	Q	W	E	R	T	Y	U	I	O	P		NLine															
	PRINT	<table><tr><td>Lock</td><td>A</td><td>S</td><td>D</td><td>F</td><td>G</td><td>H</td><td>J</td><td>K</td><td>L</td><td>:</td><td>"</td><td>}</td><td></td></tr></table>												Lock	A	S	D	F	G	H	J	K	L	:	"	}	
Lock	A	S	D	F	G	H	J	K	L	:	"	}															
RLUP	RLDN	<table><tr><td>Shift</td><td>></td><td>Z</td><td>X</td><td>C</td><td>V</td><td>B</td><td>N</td><td>M</td><td>,</td><td>.</td><td>?</td><td>Shift</td></tr></table>												Shift	>	Z	X	C	V	B	N	M	,	.	?	Shift	
Shift	>	Z	X	C	V	B	N	M	,	.	?	Shift															
Lt	Rt	<table><tr><td colspan="2">RESET</td><td>INS</td><td>ALT</td><td colspan="6">Space</td><td>ALT</td><td>DEL</td><td>ENTER</td></tr></table>												RESET		INS	ALT	Space						ALT	DEL	ENTER	
RESET		INS	ALT	Space						ALT	DEL	ENTER															

TN 5250 numeric keyboard for PTC-113X, 114X, and 118X

FLDPL	EINP	1	2	3	4	5	6	7	8	9	0	BKSP	NLine
Tab	BTab	RESET	Ins	Space								Del	Enter



Appendix B

Wand sequencing for AIRVU TN 3270 and AIRVU TN 5250 emulation

The following table shows bar-code scanning sequences and their key equivalents.

Key	Wand sequence
ATTN	\$A
BKSP (EEOF in 3270)	\$B
CLEAR	\$C
DUP (CAPS in 3270)	\$D
ENTER	\$E
LCD adjust	\$F
EINP	\$G
HOME	\$H
INSERT	\$I
FLD+/EXIT (TAB in 3270)	\$J
FLD- (BTAB in 3270)	\$K
LIGHT	\$L
ALTCR	\$M

Key	Wand sequence
NLINE	\$N
DEL	\$O
PRINT	\$P
HELP (EXIT in 3270)	\$Q
RESET	\$R
SREQ	\$S
STAT	\$T
ROLL UP (PA1 in 3270)	\$U
ROLL DN (PA2 in 3270)	\$V
= (PA3 in 3270)	\$W
EXIT (= in 3270)	\$X
"	\$Y
/	\$Z
&	%A
*	%B
(	%C
)	%D
\$	%E
%	%F
^	%G
!	%H

Key	Wand sequence
@	%I
#	%J
. (period)	%K
- (dash)	%L
_ (underscore)	%M
' ' (space)	%N
(pipe)	%O
~ (tilde)	%P
' (left quote)	%Q
' (right quote)	%R
\	%S
: (colon)	%T
; (semicolon)	%U
?	%V
{	%W
}	%X
, (comma)	%Y
+	%Z
a	+A
b	+B
c	+C

Key	Wand sequence
d	+D
e	+E
f	+F
g	+G
h	+H
i	+I
j	+J
k	+K
l	+L
m	+M
n	+N
o	+O
p	+P
q	+Q
r	+R
s	+S
t	+T
u	+U
v	+V
w	+W
x	+X

Key	Wand sequence
y	+Y
z	+Z
F1	/A
F2	/B
F3	/C
F4	/D
F5	/E
F6	/F
F7	/G
F8	/H
F9	/I
F10	/J
F11	/K
F12	/L
F13	/M
F14	/N
F15	/O
F16	/P
F17	/Q
F18	/R
F19	/S

Key	Wand sequence
F20	/T
F21	/U
F22	/V
F23	/W
F24	/X
TAB (< in 3270)	/Y
BTAB (> in 3270)	/Z



Appendix C

Configuration parameter quick reference

The following table lists AIRVU configuration parameters and their default values.

Parameter	Range	Default
Main Menu Parameters		
RX	Receive File Transmit File Exit	None
Flash	System Control User Control Exit	None
PTC configuration parameters		
PTC ID	001-254	001
Proximity Scan (PTC-912)	Off /On	Off
Display Intense Fields As	Normal/Reverse	Reverse
Status Line	Disable/Enable	Enable
Cursor Type	Underline/Block	Underline
PTC Timeout	0-60 min	5 min
Bklt Timout	0-240 sec	30 sec
Backlight After Keypress	Disable/Enable	Disable
Bypass Exit Menu	Disable/Enable	Disable
Auto Run	Disable/Enable	Disable

Parameter	Range	Default
Use Print Bit (3270)	Ignore Bit/Use Bit	Ignore Bit
Printer (TN 5250)	Local/System	Local
Update Cursor Upon New Chunk (TN 5250)	Disable/Enable	Disable
RF parameters		
Primary System ID	2-fffffe (hex)	000002
Port Number	00000-65535	00023
Primary # Channels (900 MHz)	1-4	1
Primary Channel (900 MHz)	0-11	11
Primary Frequency (2.4 GHz)	1-5	03
Primary Bit Rate (2.4 GHz)	1-4	04
Primary Host IP Address	A character string consisting of four integers separated by a decimal point. Valid integers are 0-254 for PTC IP Address and 0-255 for all other parameters.	None
PTC IP Address		None
Broadcast Address		255.255.255.255
Subnet Mask		255.255.255.0
First Router		None
Second Router		None
Address of First DNS		None
Address of Second DNS		None
Address of Third DNS		None
Clear ARP Table Upon Startup	Do not clear/Clear	Clear
Network Timeout	0-30 sec	00030
Registration Mode	Normal TMA/Power Saving TMA	Power Saving TMA

Parameter	Range	Default
Registration Refresh Rate	0-65535 ms	0
Poll Delay	0-65535 ms	500
Poll Decay	0-255 ms	2
Fast Polling	0-65535 ms	250
Slow Polling	0-65535 ms	10000
ARL Threshold	0-255	4
ARL Decay	0-255	1
Find Router Size	1508 bytes/8 bytes	1508 bytes
Display parameters		
Display Type	16x21 16x6 8x21 8x16 Quit	None
Wand parameters		
Short Scan	Disable/Enable	Enable
Clear to End of Field	Clear/No clear	Clear
Enable Scanner on Light Pen Enabled Field (TN 5250)	Light Pen/All Fields	All Fields
Auto Key Upon Scan (TN 5250)	None Field Exit Enter Both	None
Auto Send (TN 3270)	None Scanned High Highlighted All Scanned All	None

Parameter	Range	Default
Wand Type	None Pencil Laser RS-232 None	None
Wand Sequencing	Disable/Enable	Disable
Shuffle Barcode Order	Shuffle/Keep Order	Shuffle
Number of Barcodes to Configure	0-6	4
Barcode #n Label Type	Plessey Code of 5 UPC Misc Advanced	Misc
Label Length	0-64	
Generic Options	Depends on barcode selected in Barcode #n Label Type parameter	None - see Chapter 3, pages 60-63
Label Options	Depends on barcode selected in Barcode #n Label Type parameter	None - see Chapter 3, pages 64 - 65
Drop First	0 - 15 decimal characters	1
Drop Last	0 - 15 decimal characters	1



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